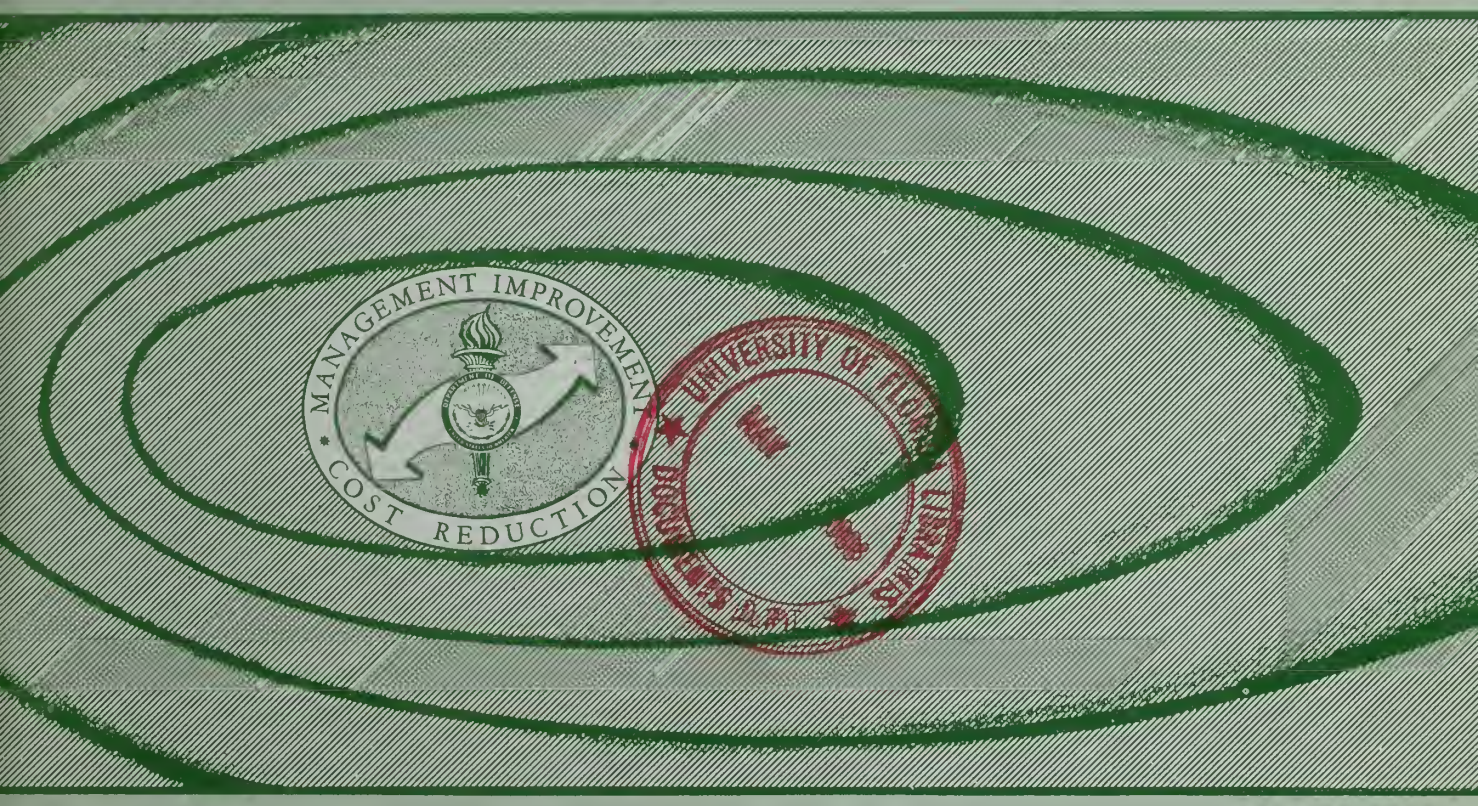
Defense Management Journal

DOD COST REDUCTION AND MANAGEMENT IMPROVEMENT PROGRAM



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ARTICLES

FEATURES

REPRINTS

Defense Management Journal

(formerly Cost Reduction Journal)

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The Defense Management Journal is published quarterly by the Directorate for Cost Reduction and Management Improvement Policy, Office of the Assistant Secretary for Defense (Installations and Logistics), for distribution within the Department of Defense.

The Defense Management Journal seeks to stimulate cost reduction ideas, promote cost consciousnes, and enhance understanding of efficiency programs. The Journal's content includes: (1) cost reduction goals and accomplishments; (2) policies and procedures of the cost reduction system; (3) cost reduction techniques and processes in all functional areas from which savings are derived; (4) new developments in concepts and philosophy that affect cost reduction objectives; and (5) specific cost reduction examples, with attribution where appropriate.

Inquiries dealing with the Journal's policy and content may be directed to: Editor, Defense Management Journal, OASD(I&L), Pentagon, Washington, D.C. 20301.

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EDITORIAL

Selling to Uncle Sam

by THACHER LONGSTRETH

Publisher, Greater Philadelphia Chamber of Commerce News

The following editorial appeared recently in the Greater Philadelphia Chamber of Commerce News. Permission to reprint is appreciated.

BUSINESSMEN have resented government regulation for many centuries, although the Laissez Faire attitude of government which existed until this century kept them relatively free of rule or regulation.

Today, however, political and economic pressures bear ever more heavily upon us, and cries for "truth in packaging," or "truth in lending," etc., fill the air. Unfortunately, too frequently these cries have substantial justification, and the dishonesty and depredations of "fly by night" operators are frequently attributed to business as a whole.

More than ever this places the responsibility of policing its own activities upon the business community, unless that community is willing to accept the inevitability of local, state and Federal controls.

I was alerted to a case in point along these lines recently through conversations with top officials at DISC (Defense Industrial Supply Center) one of the most important government purchasing establishments in the eastern United States, employing over 2,700 people in Northeast Philadelphia. They pointed out to me that too many government organizations such as theirs were paying exorbitant prices for some items of low unit value because of the questionable practices of some of their suppliers. For example, a gear spur already on hand, with a catalogue price of $3.43, was represented to a government agency as a specially made item and sold for $194.30. A clamp hub, with a catalogue price of $2.60, went for $22.86. Another gear spur at $10.75 went for $62.50, and a straight shaft, which had cost the manufacturer 50 cents, was sold to the government at a bargain price of $25.55.

At first blush this might seem like a normal instance of "caveat emptor," with the government purchasing department placed in a pretty silly light for paying prices of this magnitude. However, in instances such as those which I have cited above, the Department of Defense buyer was making a first time buy on the item under close deadline for emergency requirements. Frequently, the only purchase description available was simply a part number with no previous purchase price history or catalogue available against which to compare the bid price.

At a time when this country is engaged in an extremely costly war in Viet Nam it seems incredible to me that legitimate business firms would quote and obtain exorbitant prices for defense materials and give price quotations to government purchasing agents without supplying them with adequate information on existing supplies or indicating price breaks where differences in quantity of purchase would have made a substantial unit price difference.

Certainly the Defense Department must sharpen up its buying practices and the manufacturing practicality of its specifications, but just as certainly business is faced with a responsibility of offering fair prices for goods or services delivered. The inevitable reaction to overpayments will be tougher and tighter monitorship by government buyers, leading to "red tape" which will slow down and complicate our relationships.

I would strongly advise that all members engaged in such Defense business review their pricing policies so that they can never be accused of having taken advantage of our Federal government in a time of acute need, or at any other time for that matter.

COMMENTARY

Organizational Shift

February was the month for organizational change within the Office of The Assistant Secretary of Defense for Installations and Logistics. Here is the "from" and "to" of it all:

Directorate	From Deputy Assistant Secretary	To Deputy Assistant Secretary
Contract Support Services.....	Gibson.....	Malloy.
Tech Data and Standard. Policy.	Riley.....	Fouch.
Maintenance Policy.....	Fouch.....	Riley.
Cost Reduction and Management Improvement.	Riley.....	Fouch.

Thomas D. Morris, Assistant Secretary of Defense for Installations and Logistics, stated that his objective in shifting the Cost Reduction and Management Improvement Program was to "place under unified direction the development, evaluation and implementation of logistics management systems and programs that impact upon and require participation of several functional managers within the OASD (I&L)."

Along with the responsibility for the Cost Reduction and Management Improvement Program came a change in title for George E. Fouch—from Deputy Assistant Secretary of Defense (Equipment Maintenance and Readiness) to Deputy Assistant Secretary of Defense (Logistics Management Systems and Programs).

Emblem

The Journal's cover presents the official emblem of the Department of Defense Cost Reduction and Management Improvement Program.

The ellipse shapes the Program's scope. An ellipse—says the dictionary—is "the path of a point that moves so that the sum of its distances from two fixed points (called *foci*) is constant." The Program's *foci* are *cost reduction* and *management improvement.*

The two-way arrow, styled in a modernistic curve for space-age flavor, slants down for cost and up for improvement. The core is the DoD seal.

Sic Transit Mensus

The word was "Go" for 11 management improvement subprograms when Enclosure 2 to DoD Instruction 7720.6 was signed on February 4. Another 50 subprograms are still being given a reading. Some will "make the scene" at a later date; some will not.

The purpose is to *measurably* improve performance in each subprogram. The necessary ingredients are: an objective performance indicator, a base period from which progress can be measured, and a goal. Of the three, the indicator—or standard—comes first.

Management systems designers frequently venture into virgin territory to carve out that single telling standard from amidst a forest of irrelevant data. Lest success drenches their natural professional modesty with the conviction that these finds will be everlasting, it may be apropos to remind them of the sack, clove, butt, pipe, drachm, fotmal, charre, fother, chaldron, puncheon, firkin, tun, dolium, tierce, summa, and stake.

All of these were commercial measures used in 18th Century England. All are now obsolete.

Starting Points

Medicine has its *Gray's Anatomy* and the law its *Corpus Juris.* Both are starting points for professionals seeking definitions and general understanding—a jump-off point to the more sophisticated literature for a specific problem.

Where is the "Open Sesame" for the professional logistics manager? Right—There is none now! But in 2 months (hopefully) there will be the substance of a beginning. Nineteen Cost Reduction Subgroups are reviewing 7 years of "new, improved or intensified management actions." Their objective is to assemble and

organize existing management data in an accessible format.

The trick is to codify the *kinds* of efficiency techniques that have proven so successful over the past 7 years. To do this, each subgroup has to stratify each cost reduction category to a reasonable depth and then classify the components in each stratum.

Example:

The Subgroup for Real Property Maintenance and Operations suggested the following six-level stratification for codifying ideas that contribute to the improved management of *Electrical Utilities.*

(Note that the single *relevant* component within each level becomes the designation of the next lower level.)

1. LOGISTICS ELEMENTS
- Buy only what is needed.
- Buy at lowest sound price.
- *Reduce operating costs.*

2. REDUCE OPERATING COSTS
- Terminate unnecessary opn's.
- Reduce operating expense.
- *Increase efficiency of opn's.*

3. INCR. EFFIC. OF OPERATIONS
- Telecom.
- Equip. Maint.
- P.P. & P.
- Transp.
- Mil Housing.
- *Real Property M&O.*

4. REAL PROP. MAINT. & OPN.
- Maint. of Real Prop.
- Minor Construction.
- Other Engineering.
- *Operation of Utilities*

5. OPERATION OF UTILITIES
- Heating.
- Water and Sewage Systems.
- Air Cond. & Refrig.
- *Electrical.*
- Other.

6. ELECTRICAL

Old cost reduction hands will immediately recognize levels 1, 2, and 3 as a direct take from the current Cost Reduction Program. The subgroup simply added levels 4, 5, and 6.

Having thus structured its area of the Cost Reduction Program, the subgroup then must identify the "management improvement actions" that contribute to improved management of Electrical Utilities. A partial page from its catalog might look like this:

6. ELECTRICAL
- Combine billing for several metering points.
- Combine loads of adjacent transformers and deenergize unneeded transformers.
- Consolidate existing metering points.
- Develop cyclic relamping program (vs. spot replacement).
- Install load control devices (in housing areas) to disconnect appliances at hours of system peak.
- Schedule heavy loads for offpeak hours.
- Eliminate oversized lamps and overlighted areas.
- Etc.

(Of course, "where feasible" is a caveat built into each and every one of these improvement ideas.)

The subgroup will do the same job for all level 5 classifications as it did for *Electrical Utilities.*

Multiply that effort by 19 (total number of subgroups) and a fairly hefty "Ideas Book" for logistics managers should emerge.

Each subgroup will also develop a short bibliography of worthwhile reading for managers in its cost reduction area.

The plan is to integrate the combined efforts of the 19 subgroups between one set of covers—then print and distribute it throughout the DoD. Admittedly, it won't be *Corpus Juris,* but it will be the only organized, codified compendium of cost-saving ideas available to logistics operators and managers as:

a. a source document for new ideas

b. a reference document for problem solving.

Target date for a completed product is mid-summer. □

THE SECRETARY OF DEFENSE
WASHINGTON

MAY 3 1968

MEMORANDUM FOR Secretaries of the Military Departments
Chairman of the Joint Chiefs of Staff
Director of Defense Research & Engineering
Assistant Secretaries of Defense
Assistants to the Secretary of Defense
Directors of the Defense Agencies

SUBJECT: DoD Cost Reduction and Management Improvement Program

The Department of Defense has achieved a remarkable and enviable record for efficient management -- a record that has prompted the President to say that "this Department has proved my conviction that we can have combat readiness, good business management, and economy in our defense."

I expect that record to be maintained -- and enhanced -- in the months and years ahead.

I look to each of you to see that cost reduction receives the same high priority it has had in the past, and the same emphasis on (1) buying only what we need, (2) buying at the lowest sound price, and (3) reducing our operating costs. I desire especially that there be no relaxation in your efforts to employ competition in the award of Defense contracts.

Clark M. Clifford

The author (center) confers with Air Force officials in a personal exemplification of his point that "lines of communication for exchanges of views between the GAO and all departments and agencies of Government be kept in constant repair."

AUDITING LOGISTICS MANAGEMENT

"Independent evaluation is an essential function of the American system of government which goes to the heart of the separation of powers."

WHEN SECRETARY MORRIS invited me to speak to Department of Defense logistic managers through the columns of the *Defense Management Journal,* I was delighted because it provided me with an opportunity to bring you up to date on developments in the General Accounting Office and on some of our future plans.

In so doing, I hope to emphasize why GAO gives high priority to logistics management in DoD.

I welcome this opportunity for another reason. It is highly important that the lines of communication for exchanges of views between the GAO and all departments and agencies of the Government be kept in constant repair. It is only through adequate communication that managers such as yourselves understand what GAO is trying to accomplish. Likewise, it is important that GAO in turn, understand better the difficulties involved in carrying out your operating responsibilities.

Our auditors are often asked by logistics managers why their particular organization or activity is being reviewed by the General Accounting Office. In effect they are asking, "why me"? The fact that the question is frequently asked suggests a need for clarifying how we operate; how we decide what areas we are going to look into.

ELMER B. STAATS
Comptroller General of the United States

It is almost a truism that no one likes to be evaluated by an outsider. However, independent evaluation is an essential function of the American system of government which goes to the heart of the separation of powers. In this work the GAO provides a service essential to the Congress in the execution of its responsibilities of legislative oversight.

The U.S. defense logistics system today embraces the largest inventory to be found in any organization in the world—approximately 4 million items classified, identified, and catalogued within DoD; inventories valued at about $37 billion, excluding aircraft, ships, supplies and equipment in the hands of operating units; and, Government-owned property in possession of defense contractors amounting to about $11 billion.

But, the test of logistics is not in its mass. The test comes when large forces, deployed quickly to distant trouble spots, must be supported in sustained combat. The conflict in Southeast Asia where the United States now has more than 530,000 military men (including those afloat) at the end of a 10,000 mile supply line has provided such a test.

Another test is that logistics effectiveness be matched by an equal degree of cost awareness and operating efficiency to assure the prudent use of our Nation's resources.

The General Accounting Office is concerned with the attainment of both these goals. Despite the pressures of combat operations, they are not incompatible but complimentary.

GAO's overall role in evaluating all government activities, military as well as civilian is—as most of you know—to assist the Congress, its committees, and individual members. We provide the Congress, as its agency, with direct staff assistance with our reports on our audit observations, most of which are intended to result in greater efficiency and economy in all government operations. The GAO is an important part of the management information system of the Congress.

Scale of GAO Audit Work in DoD

In its work on the military side of the Government, GAO currently has assigned approximately 1,000 men to audit and review work in the DoD, conducted by its Defense Division. Nearly 800 of the staff are in 16 regional offices located throughout the continental United States and in overseas offices in Frankfurt, New Delhi, Manila, Saigon, and Honolulu.

Within the Defense Division, an Associate Director is responsible for work in each of the following areas:

- Supply management and maintenance.
- Procurement.
- Manpower.
- Facilities and construction.
- Management control systems.
- Transportation and support services.
- Research and development.

Twice each year the Associate Director in charge of each function specifies new assignments he proposes to initiate during the next 6-month period. His selection is based primarily on a long-range plan designed to assure coverage of all important aspects of each function.

This plan is flexible, however, and it is adjusted from time to time to reflect changes in emphasis required by world conditions or new programs within the Defense Department.

Each 6-month program is affected also by other demands made upon GAO such as:

- Requests by congressional committees or members of Congress for specific inquiries, investigations, or reviews.
- Indications of general congressional interest in specific areas.
- Application by DoD of major resources in terms of men, money, or materiel to a particular function or subject area.
- Indications of specific agency operations which are believed to be in particular need of management improvement and which represent potential for savings.

In the formulation of current audit programs GAO tries to make broad inquiries into some of the more complex logistical areas and come to grips with basic underlying causes of management problems. This does not mean GAO foregoes reviews of individual cases. Individual cases requiring attention must, of course, be brought to the attention of officials responsible and, whenever warranted, to the attention of Congress.

Survey of Military Supply Systems

An example of the broad types of inquiries GAO undertakes was its recent survey on the responsiveness of the military supply system in meeting operational needs. This survey was conducted at various military installations and activities in the Continental United States as well as overseas. The survey was performed with close cooperation from the Office of the Secretary of Defense. At its conclusion GAO provided the Secretary of Defense with summary of its overall observations of matters warranting high level, long range considerations and management attention. GAO's principle observations were:

- There was no one organization within the Army with the overall responsibility for inventory management and design of supply systems. Result: loss of control over material, supply practices and procedures not standardized, maximum use not made of skilled personnel, and supply support not as responsive to the demands of combat units as it should have been. GAO was informed in June 1967 that the Army was instituting a system to incorporate in their entirety certain overseas depot assets in the records of inventory managers in the United States.
- The standard DoD requisitioning system, as implemented by the Army, was not permitting the processing of large volumes of transactions in a timely manner during periods of rapid force changes. GAO believed that a large part of the problem was attributable to an unnecessarily large number of Federal catalog changes and the lack of adequate training on the part of supply personnel at the requisitioning level.
- The stock fund method of financing the acquisition of supplies by using units was not sufficiently responsive to the needs during periods of rapidly increasing demands. GAO held that certain modifications to the stock fund system were necessary with respect to their application to combat support units. Procedures for the Army stock funds have been changed so that units in combat zones no longer needed to concern themselves with stock fund limitations.
- Practices involving the incremental funding of procurement requirements needed improvement in order to preclude delays and increased costs in the purchasing of critically needed material.
- There was a need for improved transportation management and the reliability of communications.
- The use of the productive capacity of contractors in the aircraft industry required, in GAO's opinion,

further study for the purpose of determining methods for increasing that capacity available to the military departments.

- Information regarding increased force levels and flying hour programs needed to be provided to responsible inventory management officials more promptly in order to effect timely requirement determinations and procurement actions.
- Increased attention needed to be given to the distribution and training of logistics personnel and the ratio of logistics units to tactical and other units supported.

GAO identified 82 further opportunities for improving the supply systems at various operating levels. For example, we found a need to increase the supply support of the Marine Force Service Regiment from the 2d Logistics Command of the Army through interservice supply support agreements. Effective support to the Marines did not appear to be occurring through these support agreements. The Marines were ordering the same items directly from the continental United States. Subsequently, a new agreement was signed by the Army and the Marine Corps, after the Marine Corps had provided the Army with a list of items representing approximately 2,000 Federal stock numbers which would be required by the Marine Corps.

Another example was GAO's observation of a need to improve accuracy of transceiver transmission of Marine Corps requisitions from Vietnam to Okinawa. Requisitions were being carried by courier because transceiver transmission was unreliable. We understand that courier service either has been, or will be, discontinued upon complete installation of an automatic switching service being installed within the Pacific area.

At the direction of the Secretary of Defense a procedure was developed within the Department to review all these recommendations and to report to the Secretary and the Comptroller General on actions taken.

We have been pleased and impressed with the results of the military services' actions to accomplish improvement in all the areas cited.

Supply Activities in Vietnam Reviewed

More recently GAO reviewed certain aspects of the Army's supply management system in Vietnam. This review showed that the system has been responsive to combat needs. A high level of support has been achieved there despite adverse conditions with which anyone who watches television these days is familiar.

While GAO recognizes that the rapid buildup of forces in Vietnam dictated the measures taken in the beginning to provide the supplies needed, we believe greater attention can be directed toward improving the efficiency of the system.

The Army had been aware of this need before we came on the scene. A number of programs had been undertaken to improve its management of supplies there. The results of GAO's Vietnam review demonstrated, however, that even these well conceived actions were not adequate to achieve the degree and scope of management improvement that was necessary and possible.

GAO believes the Army could supply its forces in Vietnam effectively, at the same time do its job more economically, by taking the following additional steps:

- Develop more accurate data relating to stocks on hand and consumed;
- Identify and redistribute promptly the large quantities of excess material in Vietnam;
- Develop programs to ensure prompt return of reparable components to the supply system;
- Institute procedures to increase intraservice and interservice use of available supplies; and
- Reduce costly shipment of supplies and equipment under high priority requisitions.

GAO conducted this review in an open book fashion—discussing on a day-to-day basis its findings and suggestions for improvements with responsible officials in the depots at Saigon, Qui Nhon and Cam Ranh Bay; at the 14th Inventory Control Center at Long Binh; and at Headquarters, 1st Logistics Command. At the midpoint and again at the conclusion of this 90-day review, GAO auditors discussed their observations with officials at Headquarters, U.S. Army, Vietnam; the Militray Assistance Command, Vietnam; and Headquarters, U.S. Army, Pacific, Honolulu; where there were also representatives present from Headquarters, Department of the Army and the Office of the Assistant Secretary of Defense (Installations and Logistics).

Candor and constructiveness on the part of the GAO team and a receptiveness on the part of the involved Army organizations in Vietnam led to prompt consideration and adoption of many proposed improvements in supply management. Other suggestions requiring consideration and application of resources outside of the Army's capabilities in Vietnam were considered promptly at higher echelons without at anytime compromising local commands.

Report on Navy's Inventory Accounting

In September 1967, GAO reported the results of its review of the Navy's inventory accounting system for approximately $2.2 billion worth of aeronautical spare parts and equipment. Not surprisingly, this review showed that where management decisions were based on inaccurate records, the results usually included premature procurements or underprocurements, unnecessary grounding of aircraft for lack of parts, incorrect scheduling of parts for overhaul and repair, or various other fouled-up effects.

The broad experience of the General Accounting Office in the supply management area over the years

has demonstrated continuously and conclusively that effective, efficient, and economical supply operations require:

1. Inventory records reconciled with physical inventories and so maintained as to provide management with accurate information as to quantity and location of all equipment included in a system.

2. Clear and complete understanding of the objectives of a system at all supervisory levels and realization of the costly effects that deviations from established procedures have on the management of equipment.

3. Emphasis by all commands on accuracy and on unvarying compliance with procedures established by higher authority which must base its management decisions on the data submitted.

4. Effective review of actions taken to correct earlier mistakes.

We are presently embarking on an extensive study of major weapon systems procurement. The study will take us into several activities of the Department of Defense including systems analysis, development and procurement. The purpose of our work will be to evaluate the management planning leading up to the acquisition of these systems.

We are concentrating attention in the early planning stages of weapon systems because such activities as "contract definition" greatly influence the production, supply, operation and maintenance cost over the life of the system as well as the extent of competition used in the procurement. In view of the complexity and importance of this area, members of our staff are now attending, along with industry and defense personnel, a 13-week course at the Defense Systems Management Center in Dayton, Ohio.

Accounting and Supply Management

In supply management, proper accounting is essential. Effective management of property and supplies is knowing what is owned and where it is. The Congress has legislated requirements to be followed by Federal agencies for property accounting and the General Accounting Office has responsibility for promoting effective accounting by Government agencies.

In its reviews of agency activities GAO gives full consideration to the accounting relationships to any operational or other weaknesses observed and is alert to the contributions accounting can make in overcoming those defects or in effecting improvements.

GAO's primary concern is to stimulate improvements in the management of agency activities and operations rather than to promote good accounting for itself. GAO is particularly concerned with accounting defects when they are, or contribute to, the fundamental causes of weaknesses in operations. In addition, GAO considers how accounting techniques can be used to remedy defects or improve activities under review.

The Budget and Accounting Procedures Act of 1950 charged the heads of executive agencies with responsibility for establishing and maintaining systems of accounting and internal control which conform to the principles, standards and related requirements prescribed by the Comptroller General.

Procurement Under PL 87–653

As many of you know, a substantial part of GAO's audit and legal efforts are devoted to procurement, contract audits, and the rendering of legal decisions on contract matters. A GAO report to the Congress in January 1967 pointed to the need for improving administration of cost or pricing data requirements of the Truth in Negotiations Act (Pub. L. 87–653). This report reviewed 242 negotiated supply and production contracts and subcontracts. It found that 185 of these contracts were awarded under the requirement of the law for submission of cost or pricing data and certification that the data submitted were accurate, complete, and current. In 1965 of the 185 awards there was no authoritative record certifying what was submitted and what was covered by the certificate in support of significant cost estimates. In such cases the Government's rights under the defective pricing data clause may be impaired inasmuch as it may be impracticable for the contracting officer to establish that defective data were relied on in the negotiation. The remaining 57 contracts had been determined by the contracting officials to be exempt from the requirement for the submission of cost or pricing data under exceptions contained in the law. The procurement record in these cases did not contain sufficient information in our opinion to substantiate the correctness of the determinations.

GAO made proposals to the Department of Defense designed (1) to improve identification of the cost or pricing data submitted and certified by contractors; (2) to ensure that contractors are requiring subcontractors to submit and certify cost or pricing data, and (3) to provide documentation of the circumstances leading to, and the basis for, any determinations by contracting officers or contractors that cost or pricing data are not required.

A special group was appointed under the guidance of the Office of the Deputy Assistant Secretary of Defense (Procurement) to study the GAO proposals. As a result of its work the Department of Defense prepared revisions of the Armed Services Procurement Regulations. GAO plans a review to determine if these revisions are effective after the Department has had sufficient time to implement the revised regulations at procurement offices.

There have been many reviews of the regulations implementing the Truth in Negotiations Act. As experience is gained, there will probably be more. Probably sometime in the future we will even have substantial agreement between Government and industry

that the Act is working fairly for both sides. This time will be brought nearer if both Government and industry continue working objectively, each recognizing the other's problems toward an effective balance between achieving the Act's objectives and avoiding the imposition of unnecessary procedural requirements for attaining these objectives.

Department of Defense procurement is such an important and changing area that GAO plans to concentrate increasingly on broader type reviews of procurement activities and on the use of sampling techniques. Its earlier reports in the procurement field have been valuable to both the Congress and the Department of Defense in identifying areas in need of attention. Increased emphasis on a broader approach should enable GAO to provide Congress and responsible officials of the Department with better measures of the overall definitions of the specific problems so that both will have better basis for taking corrective actions and eliminating the causes for these problems.

Secretary McNamara's Cost Reduction Program, launched in July 1962, was a truly pioneering effort in Defense management.

The President, in releasing the Secretary's CRP report for fiscal year 1967, stated in part:

> "We are determined to provide our men with everything they need to accomplish their mission but we believe, and the report proves, that such an objective is not inconsistent with continued emphasis on the elimination of waste and inefficiency."

GAO believes that the extension of DoD's Cost Reduction Program on a governmentwide basis was due in a large part to the results attained by the thousands of managers throughout the Department of Defense in response to efforts to ferret out all sources of waste and inefficiency.

The General Accounting Office will, as part of our governmentwide review of agency internal audit activities, review the audit or validation process and the criteria for measuring savings to ensure their adequacy.

Constructive GAO Contribution

I feel confident that GAO can make a constructive contribution in the period ahead to the effort of Congress and the executive agencies to obtain a still more effective use of our national resources.

In carrying out GAO's responsibilities to the Congress to appraise the effectiveness of agency operations and programs, GAO necessarily is cast in the role of a critic. We will make every effort, however, to be a constructive critic. As I have tried to show, we have the concurrent responsibility for offering solutions to problems and weaknesses which we identify. GAO can continue to fulfill this responsibility, and, at the same time, be of practical assistance to the agencies.

It is my policy to increase GAO's efforts in this direction. □

MANAGEMENT QUOTES

By WILLIAM M. ALLEN, *President, The Boeing Co.*

I am not a great *believer in* "success formulas"—yet it seems to me there is a basic truth which cannot be avoided. It is this. A profitable business must have the ability to turn out better products at competitive costs.

The job is not an easy one. It requires planning, work, and the conviction that we are the masters of our destiny. This positive attitude is not always easy to maintain, since there are some cost elements which seem beyond our direct control, such as the effects of inflation and the things that are happening in our domestic and international economy. Because of these outside influences, there can be a tendency for people to feel that increased costs are inevitable. This is not always true. It was Mark Twain who observed that, "There are many scapegoats for our sins, but the most popular is providence."

Excuses are easy to find. They may even be comforting if we let them be. However, our domestic competitors live in a similar environment and if we can be more imaginative than they are in finding answers to problems that are within our control, we should successfully meet competition from them.

Taking a larger view, America as a whole faces an increasing problem of international competition, involving lower foreign wages. There are several avenues by which we can endeavor to meet this national challenge. First, we can be more efficient in our use of labor and reduction of overhead expenses. Second, we can endeavor to maintain the technological leadership we now enjoy. But research and development take money. And that money must come from profits. I am sure you have heard much about the necessity of our improving our profit margin. It is not greed that spurs us in this objective; it is the realization that we must invest from today's business profits in order to realize tomorrow's business potential and the jobs that are a part of that tomorrow.

In such an environment, sloth, waste, duplication of effort and unnecessary effort cannot be tolerated. All too often in the past we have attempted to control or reduce expenses on a crash basis. Sometimes we are forced to do this, but experience has shown that effective cost management is not achieved by directives. Rather, it is a result of the way we do things day by day.

The Boeing Cost Improvement Program was begun because we realized the nced for a continuing long-term effort to foster cost consciousness. The rooting out of all forms of waste and unnecessary expensc was and is the program's long-term goal.

But again, all the program can do is promote—urge—point the way. It cannot create effective cost management. That is up to cach one of us. □

(Reprinted from a recent issue of The Boeing Company's newsletter "The Achiever")

MANAGEMENT AUDIT AS A COST REDUCTION TOOL

By WILLIAM J. DRIVER
Administrator of Veterans Affairs

IN WHAT HAS been termed "a formal declaration of war on waste in the Federal Government," President Johnson in late 1964 launched a systematic and long-range governmentwide cost reduction program.

To us in the Veterans Administration, this meant not only that our services and programs be maintained at the lowest possible cost to the taxpayers but also that they should remain the best possible services for those veterans and their eligible beneficiaries seeking the medical care and benefits to which they are entitled under the law.

I am proud to report that we have retained these high service standards and at the same time put into effect cost reduction methods that during 1967 alone amounted to more than $33-million.

That this was no small task can be seen when the magnitude and complexity of the Veterans Administration organization is taken into consideration. Operating under the supervision of a Central Office in Washington, D.C., are 165 hospitals, 202 outpatient clinics, 16 domiciliary homes, 5 restoration centers, 62 nursing bed care units and 57 regional offices.

This article, devoted to a specialized look at VA operations, is not the proper vehicle to discuss in detail the programs carried on in these installations, but the fact that we treated more than 750,000 patients in our own hospitals; paid $4.4 billion in compensation and pension to more than three million living veterans and to the dependents of almost a million and a half deceased veterans; expended $251 million in GI bill educational benefits to more than half a million veterans and servicemen—not to mention our home loan guaranty program, our life insurance program, our guardianship program—these are enough to show the scope of our programs and the magnitude of the workload and expenditure during 1967.

Top-Down Cost Consciousness

In the Veterans Administration, the cost reduction program receives high priority. I, as Administrator, have the ultimate program responsibility but my Associate Deputy, as Chairman of the Cost Reduction Steering Committee, is responsible for the development, effective implementation and operation of the program throughout the agency.

We are constantly seeking ways to get our job done at less cost while continuing to improve the quality of our services. Improving quality and reducing costs are objectives for managers of all our field stations and each of them understands that meeting these objectives lies in his sphere of responsibility.

Only when the entire work force has been made acutely cost conscious can the total mission be accomplished. The basic philosophy must be implanted at the top of the organization and allowed to permeate downward. Top management must set the objectives, direct the effort, and insist on accomplishment.

It has been proven profitable to use staff experts to demonstrate that doors can be opened that lead to new fields for cost reduction. The location of the cost reduction program organizationally as explained above and the use of a management audit as a control technique have been important factors contributing to the success of our cost reduction efforts.

Audit—A Sustaining Tool

Because of its size and complexities, the Veterans Administration had a readymade organizational unit to serve as a tool in initiating and sustaining the cost reduction program. I refer to VA's Internal Audit Service. While that Service is primarily concerned with management improvement through operational or management audits, cost reduction is usually a byproduct of its actions. Again, it serves as a final check since I use the Service to validate cost reduction reports submitted by all organizational elements.

The Internal Audit Service performs a staff function, completely independent of line operations. As a part of the Office of the Assistant Administrator for Management Engineering and Evaluation, it occupies a place sufficiently high in the organizational hierarchy to guarantee independence in its audit approach and to insure adequate consideration and action on its findings and recommendations.

What is management audit? As we use the term in the Veterans Administration, it can be a study, review, or evaluation of a department, staff office, program or function. It may also be a comprehensive review and appraisal of management at one of our field stations, i.e., a hospital, regional office, outpatient clinic,

Administrator of Veterans Affairs, William J. Driver, presents an award to Mildred A. Hutt of the staff of the Tuscaloosa, Ala., VA Hospital for a suggestion that improved the handling of patients' mail.

supply depot or data processing center. The management audit may be triggered by a specific request from me, a member of my staff, a department head, or as a result of the Service's own annual audit plan.

Decentralized Audit Organization

The management audit is an essential element to the effective management of a large Government agency such as the Veterans Administration. Since our contact with those we serve is primarily at the local level, our organization must be highly decentralized with capable managers at the local levels who are delegated wide authority to plan for, organize and control the administration of our many types of benefits and services.

These local managers are keenly aware of the need for cost reduction, for they are caught in the pinch of increased workloads, higher operating costs, and budget squeezes. Occasionally, though, they are so close to a situation that a problem is not recognized—not a better way of doing a job identified or considered.

To further motivate our employees we have recognized significant cost reduction accomplishments through our agency-wide incentive awards program.

The following example could serve as illustration of how results have been obtained. One of our hospitals was desperately in need of additional space. Ten miles down the road we had another hospital with a substantial amount of space. Both hospitals had laundries. For a year, the official concerned talked about the possibility of consolidating the two laundries. The department head requested that Internal Audit Service conduct a space study. This was done in about 2 weeks and a special report was submitted to the department head. Within 3 weeks, the laundries had been consolidated, and 6,500 square feet of space freed by this move was opened up to satisfy the critical needs of the hospital. In addition, the audit group identified other areas where space could be utilized more appropriately.

Management Audit Supplements Local Effort

There is then a need for outside assistance to supplement local management improvement efforts. The management audit serves that purpose quite well. Stated as simply as possible, the objective of the management audit is to determine how well the functions under audit are being performed. The audit approach includes comprehensive reviews and analyses to identify areas where management improvement action is needed, and recommendations to appropriate levels of management to assist in bringing about that improvement.

During the management audit, comprehensive analyses are made of the basic functions of management. For example, short and long-range plans are reviewed to determine if they are adequate to insure the efficient accomplishment of the mission. Local and agency policies and practices are carefully reviewed and observed to determine whether they are sound and complied with at all levels in the organization.

A detailed organizational analysis is made to identify such deficiencies as overstaffing, excessive layering of supervision, fragmentation and duplication of functions, poor morale, inadequate training and weaknesses in communication, coordination, and delegation.

The operation of the management control system is scrutinized in all its aspects to determine if management has established the means to keep adequately informed on the status of operations, to anticipate and/or identify problems, to design and institute preventive or corrective action, and to follow up to determine the effectiveness of whatever action has been taken.

Manpower Utilization A Prime Concern

A few examples will demonstrate the value of the management audit not only in improving management efficiency but also in reducing operational costs. Internal Audit Service was requested to do a management audit of one segment of our large medical program—a segment which was represented in each of our hospitals. In this case, the audit identified many instances of weakness in manpower control, including poor personnel utilization, overstaffing, organizational fragmentation, and unnecessary stratification of supervision. Recommendations for improvement were made and won approval of line management. With implementation action only partially complete, recurring savings of almost a quarter million dollars have already been realized.

In another example, the Internal Audit Service recently conducted a 3-week management audit of one of our outpatient clinics. In addition to improvements in operating procedures, the audit has resulted in immediate and recurring savings of $160,000 through improved manpower utilization and personnel practices.

Savings Far Outweigh Audit Cost

A recent comparison of the Internal Audit Services direct labor costs against measurable benefits derived from the management audit function for the first half of the fiscal year shows that (1) for every manhour spent in the field, an annual saving of $26 is proposed, and (2) for every dollar spent in the field, an annual savings of $3 is proposed. For management audits conducted in Central Office there was a benefit ratio of $10 plus for every dollar of cost.

The analysis further shows that improvement in management attributable to management audit activity ranged from moderate in some instances to marked in others.

Actually, the war on cost and the battle for improved quality of service are continuing efforts to be fought every day in almost every management action. The management audit makes the managers involved more conscious of their responsibilities and better prepared to carry them out. □

HANDICAPPED WORKERS: MANPOWER RESOURCE FOR DEFENSE

At Homestead Air Force Base on the southern tip of Florida, a mentally retarded young man deftly slices meat to be served in the mess halls. On the wall behind him is a small plaque bearing his name: "Employee of the Month"—best worker of all the 70 employees of Homestead's food services squadron.

At Niles, Ill., an amputee businessman's firm joined forces with a physician from Walter Reed Hospital in Washington, D.C., to develop an aerosol "superglue" that, when sprayed on severe combat wounds, stems bleeding with a tough film of tissue adhesive. This allows surgeons to operate more quickly and more successfully. It has saved lives.

In Army headquarters in Washington, D.C., a middle-aged woman quietly works as a clerk-typist—almost but not quite like all the other thousands of clerk-typists in offices all over the nation's capitol. She had been men-

By BERNARD POSNER

Deputy Executive Secretary of the President's Committee on Employment of the Handicapped

The author (at right) looks over the score of a new march dedicated to the handicapped, along with Major Dale Harpham, Assistant Conductor of the United States Marine Band. The march, composed by a former Marine bandsman, is performed at each Annual Meeting of the President's Committee in Washington and on other appropriate occasions.

Working together to help the handicapped help themselves Homestead Air Force Base, the Dade County Association for Retarded Children, the Meat Cutters' Union Local No. 657, and the Bureau of Apprenticeship and Training, U.S. Department of Labor teach young men from southern Florida the skills of meatcutting.

tally ill. This is her first job in 20 years. She was turned down by 11 different agencies before finding employment in the Army.

In Phoenix, Ariz., a sheltered workshop for epileptics recently was awarded a $19,000 subcontract to make containers for classified electronic equipment used in America's defenses. The workshop received the contract because it could do the job faster, better and more efficiently than any other bidder.

These are but a small sampling of the thousands of ways in which the Department of Defense has been turning to the physically and mentally handicapped as an effective manpower—and brainpower—resource in meeting defense commitments abroad and at home.

The key to utilization has been simply this: The Department of Defense looks to the strengths of the handicapped rather than their weaknesses. It looks to what they can do, rather than to what they cannot do. This accent on the positive has paid copious dividends from many points of view. The defense establishment has found a valuable source of willing manpower. The handicapped themselves have found a new independence that comes with earning a living. And communities have been the winners as many handicapped persons have left relief rolls for payrolls.

The Homestead Air Force Base project of using the services of the mentally retarded typifies how military installations across the nation have been engaging in community programs that serve not only the handicapped but themselves as well.

The Base has converted a yellow concrete warehouse to a "classroom in an icebox," where mentally retarded young men from throughout southern Florida can come to learn the skills of meat cutting. Sponsors are the Dade County Association for Retarded Children, Meat Cutters Union Local No. 657, and the Bureau of Apprenticeship and Training of the U.S. Department of Labor.

During the 3 years the Homestead program has been in operation, 102 mentally retarded men have been trained. Ninety percent have found jobs—for most the first jobs of their lives. Their earnings average $1.95 an hour. Many stayed at Homestead as full-time employees after their training. Others found jobs elsewhere.

The meat cut by the retarded trainees does not go to waste. More than 12,000 pounds a week are ground up for hamburger and sliced for stew meat to feed Homestead's personnel. Homestead saves thousands of dollars a year from this program, and the meals are delicious.

The retarded young meat cutter honored as "Employee of the Month" had been supported by his family before training. After finishing training and being hired by Homestead, the tables turned; he now supports his mother and young brothers.

The amputee in Niles, Ill., is George Barr, paraplegic veteran of World War II, head of his manufacturing business, and several years ago, named "Handicapped American of the Year" by the President's Committee on Employment of the Handicapped.

Before the aerosol "superglue" was developed, serious abdominal wounds had to be closed by suturing by a surgeon. This took time when time was crucial. Also, blood would continue to ooze from the many tiny openings left by the sutures. Then came the invention of the "superglue" by Walter Reed scientists—but there was no effective way to apply it. They tried many means—paint brushes and spray guns among them—but they were unwieldy and imprecise. Surgeons never could be sure in which direction the spray would go.

At that point George Barr was called in. He and Lt. Col. Teruo Matsumoto of Walter Reed Hospital devised a small aerosol container that a surgeon easily could handle while he operated and that was extremely accurate. The aerosol is being used only in emergencies, where the danger exists of bleeding to death from large wounds. It already has saved lives.

The mentally restored woman employed by the Army is but one of thousands of physically and mentally handicapped persons now at work in the defense establishment. During 1966 alone (latest date for which statistics are available), the Army hired 2,696 handicapped men and women; they made up 1.7 percent of all the Army's civilian accessions that year. The Navy

hired 1,592 handicapped people, for 1.4 percent of all accessions. The Air Force employed 4,555, or 3.8 percent of all accessions. Other components of Defense employed 271, or 1 percent of total accessions.

The gamut of employment ranges from the lowest grades to highest. In one office in the Defense Supply Agency, for example, an official with no legs serves as chief of a contract branch. From his wheelchair he directs contract negotiations, oversees his staff and helps to formulate contract policies. Nearby, a GS–1 messenger is at work, delivering the mail with the reliability of an electric clock. Mentally retarded, he has been hired under a special Federal employment program which eliminates written tests for the retarded and which requires only that they be certified for work by an office of the Department of Vocational Rehabilitation.

Seting forth the Federal Government's policy toward employment of the handicapped, President Johnson recently said:

> "This Government as an employer intends to show the Nation what can be done to make fuller use of the abilities of handicapped persons—with mutual benefit to these persons, the agencies that employ them, and the public . . . The full cooperation of all agencies is needed to make sure that all persons concerned with hiring, assignment and use of employees constantly examine the work to be done and apply imagination and ingenuity to reengineering jobs; to retraining employes; . . . to dealing with the handicapped on the basis of ability and fair play."

The personnel practices of the Defense establishment have been in full accord with the President's words.

The Phoenix workshop for epileptics which won a Defense subcontract has built a reputation as one of the area's leading box makers and packagers. Known as Epi-Hab Phoenix, it has handled a large number of subcontracts for Defense prime contractors in and around Phoenix, as well as on the East Coast.

In 1966, its sales volume totaled $210,000. Checks (payroll, charges, etc.) amounting to $235,000 were handled during the year. Epi-Hab is nonprofit, but it is completely self-supporting.

Epi-Hab doesn't particularly want to keep its employees. It encourages them to leave whenever they can get a chance for better jobs in outside business and industry. Through this kind of turnover, Epi-Hab is able to provide training and work experience to large numbers of epileptics and other handicapped persons each year.

Hundreds of sheltered workshops in all parts of the country have obtained Defense prime and sub-contracts. This way, the handicapped have helped to serve America's defense needs, just as the Defense establishment has served the needs of workshops. One reason for this surge of activity has been a forceful policy statement on workshops which the Department of Defense distributes widely and which is attached to most new prime contracts. The statement:

W. Keith Sidley, manager of Epi-Hab Phoenix Inc.—a workshop for epileptics—explains to Charles C. Fink (left), small business specialist, Defense Supply Agency and Paul J. Leinheiser (second from left), purchasing manager, Motorola Aerospace Center, the construction of shipping crates to be used by Motorola for shipping classified electronic equipment.

> "The sheltered workshop of the President's Committee on Employment of the Handicapped and organizations of the physically and mentally handicapped is endorsed by the Department of Defense and the General Services Administration. Sheltered workshops can supply a wide variety of goods and services at competitive prices, and Government prime contractors are encouraged to give these workshops every opportunity to compete for subcontracts . . . ."

Recently the Defense Department and the President's Committee surveyed the capacities of several hundred workshops in the United States. Findings were published in a directory distributed to all military installations in the United States, along with a reminder to be sure to consider workshops as valuable resources.

The many-sided activities of the Department of Defense regarding the handicapped have not been motivated by charity, not by pure compassion, not by social experimentation. Instead, Defense has found the handicapped to be a reliable, loyal, efficient, highly motivated source of manpower. And Defense has given the handicapped exactly what they have been seeking all the years—an opportunity to prove to America what they can do, an opportunity to prove their worth to their country and to themselves. □

A NEW CONCEPT FOR AERIAL SHIPMENT— *PIGGY BACK*

Five "Hueys" await loading on a C–133 Cargomaster for airlift to Vietnam. Piggy-backing the tail boom on the main fuselage makes it possible for each aircraft to carry more helicopters.

Two professional soldiers have "piggy-backed" UH–1 helicopters into C–133 Cargomasters for shipment to and from the combat zone and—as a result—uncovered a multimillion dollar bonanza. The two professionals are Maj. Dennis Boyle and M. Sgt. William A. Lilley. The innovative flash came to them while on a TDY assignment from ARADMAC to Vietnam.

An Idea Conceived

These two men were on the flight line at Tan Son Nhut Air Base at 2 a.m., participating in the unloading of a shipment of UH–1 "Huey" helicopters. The "Hueys" had just arrived in Vietnam from ARADMAC in an Air Force C–133 Cargomaster.

Discussion led to the possibility of removing the tail boom of a "Huey" and mounting it on top of the fuselage during shipment (thus the term piggy back). The thought was that this arrangement would make it possible for the huge cargo plane to accommodate one or two additional helicopters per shipment. If workable, the idea would reduce number of flights required and speed up the delivery of helicopters.

Two other important factors were considered. First, ARADMAC is charged with repairing a specific number of helicopters each year by the U.S. Army Aviation Materiel Command; and secondly, aerial shipments of the helicopters are accomplished by a contractual agreement between the Army and the Air Force for a standard cost figure per round trip. The cost of the aerial shipments remains constant regardless of the number of helicopters on each load. Adding additional helicopters on each shipment would allow the Army to reduce the number of contracted flights per year, thereby saving estimated millions of dollars. To be more specific, the first year's estimated savings will

Colonel Floyd H. Buch, CO of the Army's Aeronautical Depot Maintenance Center, places the names of Master Sergeant William A. Lilley (center) and Major Dennis Boyle on the ARADMAC Roll of Economy Champions for 1968. Boyle and Lilley were responsible for the piggy-back concept now used in shipment of helicopters.

be approximately $1.2 million with second year savings estimated at $3.5 million.

Preliminary Findings

On their return from the TDY assignment, Major Boyle and Sergeant Lilley consulted with Mr. Burnett Torgerson of the ARADMAC Engineering Branch to find out how practical their idea was.

Together, they decided the concept of "Piggy Back" configuration was worth pursuing.

Several problems had to be met in following through with the investigation.

The first of these was the fact that there were two basic configurations of the UH–1, the "B" and the "D" models, each with slightly different dimensions in the length of the fuselage and the tail boom sections. Therefore, two different cradles would have to be built for mounting the tail booms on top for air shipment.

The second problem was that there were also two models of the C–133 Cargomaster. One of the models has a single receiving door in the after section of the aircraft, which opens inward and the other has a split door with both sections opening outward. The latter of these, of course, did not present any loading problems.

The fact that contracted flights can only be made for an aircraft type, with no model specification, meant that systems for loading would have to be worked out for both C–133 models.

It was at this point that the suggestion became an engineering matter and Mr. Torgerson was given the project to work out the details.

ARADMAC Engineer Goes To Work

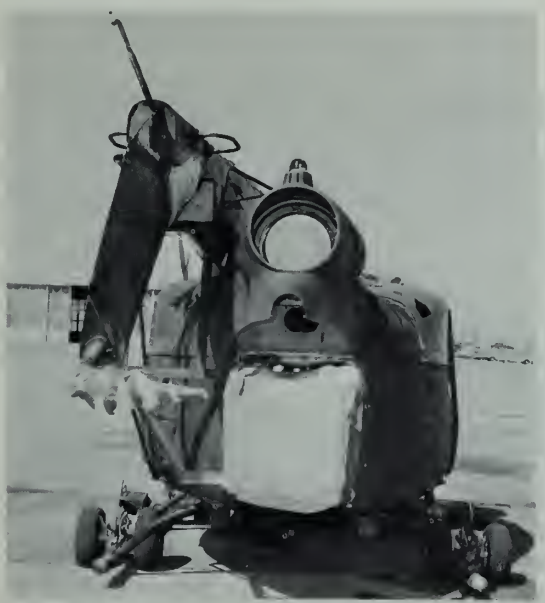
He and two men from the shops division went to work developing the first prototype of the tail boom cradle. Using a penciled sketch drawn by Major Boyle and Sergeant Lilley, they spent 3 days building a prototype before blueprinting all of the engineering specifications.

The blueprints indicated (with all weights and dimensions considered) that it was possible to load five helicopters on one C–133 when prepared for aerial shipment in the "Piggy Back" configuration.

While waiting for enough cradles to be built to prepare five of the "Hueys" for the first aerial shipment, personnel from the Directorate for Maintenance drew the outline of a C–133 interior on the ramp adjacent to the flight test hangar. When the Hueys were ready, they were lined up within the imaginary C–133 fuselage. The outline on the ramp was also used to practice loading procedures.

First Shipment Proves Concept

The first "piggy-back" shipment occurred on May 14, 1967.



The "B" model of the "Huey" has the tail rotor section of the tail boom facing aft in the "piggy-back" configuration.

The "D" model of the "Huey" has the tail rotor section of the tail boom facing forward in the "piggy-back" configuration.

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A UH–1B is angled into position inside a C–133. Worn-out mattresses are used to cushion the rotor blades tied down beneath the helicopters.

The yawning tail section of the C–133 easily receives a UH–1B as ARADMAC employees slide the helicopter into position.

Eighteen similar aerial shipments were made in the following 6 months. In all, the 19 shipments have delivered 95 helicopters to Vietnam.

The old system (with only 3 helicopters to a complete load) would have required 32 flights to ship the same number of aircraft. Thus, the Army saved the cost of contracting for 13 aerial shipments in that 6-month period. Continuation of this concept for the remainder of the year will save the U.S. Army approximately $1.2 million. Future savings will depend upon the number of helicopters to be repaired in CONUS and returned to overseas destinations.

Col. Floyd H. Buch commands the U.S. Army Aeronautical Depot Maintenance Center where a flight-line conversation blossomed into a hefty cost reduction.

PLANES SKIDDING DO BIDDING— NO KIDDING

"If you really want to get the job done—and done properly, you've got to grease the skids!"

That is precisely what a warehouseman at the New Cumberland Army Depot did to save the Government $3,736 in a single year.

Last spring, the Depot was given the responsibility of repairing CH–47 "Chinook" helicopters being returned from Vietnam. The Air Force's huge jet-prop C–133B Cargomaster was selected to do the job of airlifting the "Chinooks" from Southeast Asia to the depot in south central Pennsylvania.

It was a ticklish project for the civilian workmen at the depot during the offloading operation. They observed from the very first time they saw the big, twin-jet helicopter neatly placed in the cavernous fuselage of the C–133B that there was a scant 12-inch clearance on both sides and on the top of the rotary-winged aircraft.

Additionally, they observed that the helicopter tires were deflated to meet the clearance requirements—which meant that it was impossible to use a steering bar on the wheel assembly as the aircraft was off-loaded through the wide clam-shell doors at the rear of the C–133B.

So that no damage would be done to the interior of the C–133B, the aircraft crew chief would set up a block and tackle arrangement that straightened out the helicopter everytime it started to swerve from side to side during the off-loading.

Workmen watched as the crew chief took about 20 minutes to rig his block and tackle, and then start the cargo moving. Because of the tremendous size of the aircraft and the bulk of the cargo it was carrying,

the block and tackle had to be set up three to five times before the off-loading was finally completed.

One of the workmen that stood by waiting for the helicopter to finally clear its transporter was Lawrence L. Jones, a depot warehouseman with 17 years service in the Federal Government.

After waiting 3 hours on the flightline to receive a helicopter one day, Jones came up with a simple idea that he thought would save considerable time and energy.

Jones suggested coating two metal plates with a layer of grease and placing them under the helicopter tires. Three men could then easily move the helicopter to the desired position while its deflated tires were riding on the greased plates.

Jones computations for off-loading "Chinooks" with a block and tackle device showed that it cost the Government $37.36 an hour in wages for the 12 men on the flightline—a total of $112.08 for the 3-hour operation. Fifty unloadings a year cost $5,604.

Employing Jones' "grease job," the whole operation could be completed in 1 hour at a cost of $37.36 and the entire 50 loadings planned for fiscal year 1968 would cost $1,868—saving $3,736 a year.

Jones' idea, put into effect on May 16, 1967, was so enthusiastically received by the loadmasters on C–133B's arriving at New Cumberland Army Depot that the system was adopted in Vietnam. Also, the Boeing-Vertol Plant in Morton, Pa. sent their engineers to New Cumberland to watch Jones' "grease job" and are now planning to use it at their plant.

Jones netted $190 in the suggestion program.

COVER UP

Sharpe Army Depot, Lathrop, Calif., has shown again that it is no lightweight in the savings division, having recently unleased a socko punch against heavy, hard-to-handle covers that protect aircraft during shipment.

Substitution of lower weight, less expensive 10-gauge cloth (FSN 8305–#10–4131) for the usual weightier, more costly 18-gauge laminated stuff (FSN 8305–926–1584) reduced:

- Manpower requirements (two men instead of four can now cover an aircraft).
- Weight and cube of covers airlifted back to Sharpe for reuse.

The lighter, less costly material is now being used on the UH–1 (Huey) and OH–6A helicopters. In addition, 50 covers are being readied for use on the Army's AH–1G (Cobra) helicopter. Applications to other types of aircraft are in the offing.

Savings this year total $13,900.

BEFORE—heavy, 18 gauge cover

AFTER—light, 10 gauge cover

MANAGEMENT EDUCATION AND TRAINING IN DEFENSE

The author (2d from left) discusses the military educational system with resident students in a recent visit to the Industrial College of the Armed Forces.

Continuing Education Improves Management

In 1962 *Dun's Review* asked 300 top executives: "Which are the 10 best managed companies in U.S. industry, and what is the most outstanding ability of each one?" "An active training program that keeps new managers continually pressing to the fore and established managers on their toes . . ." was one of the six common denominators in the companies selected.

A 1964 publication *Classrooms in the Military* describes the more than 300 schools at Department of Defense installations that are training to keep abreast of the research, education and technology revolution.

ALFRED B. FITT

Assistant Secretary of Defense (Manpower and Reserve Affairs)

The study concludes: "Education becomes a life process. This situation is recognized by the Armed Forces to a greater extent perhaps than by any other segment of American civilization."

Aware of the need for continuing management improvement and the responsibility to provide appropriate training opportunities, the Secretary of Defense and the Departmental Secretaries have emphasized the need for continuing educational opportunities in the broad spectrum of management training and education. Such training is provided to develop the specialized skills which will assure maximum efficiency and skillful professional performance and to prepare military and civilian personnel for higher responsibilities.

Three Categories

The management education and training programs discussed herein are those which are concerned with the business management aspects of Defense. Three broad categories of management education and training may be identified. First is the area of general management—the principles and practices which relate to activities such as organizing, planning, controlling, communicating. The second category is functional management. This applies to specialized areas such as the resources utilization functions of personnel, financing, research and development or logistics management. And the third area includes managerial analytical techniques. Here we refer to areas such as systems analysis, quantitative analysis, managerial economics, operations research, and the like.

To provide training in these areas, the Military Departments use in-house schools as well as civilian educational institutions. Many of the courses at the in-house schools are identified as Defense management courses because they meet a common management education and training need of more than one Department of Defense component. Courses covering subject matter peculiar to the needs of a single Department of Defense component are also provided at the in-house schools.

The range of course offerings extends from areas such as general management, computer installations management, industrial management, systems management to supply management, maintenance management, to applied mathematics and statistics.

A number of schools provide training in management. To illustrate the opportunities available, I would like to present examples of some programs at several key institutions engaged in management education and training.

Management Engineering

The U.S. Army Management Engineering Training Agency (AMETA) is located in Rock Island, Ill. This Agency offers over 50 courses, workshops, and seminars in management engineering areas. Attendees come from all of the Military Departments as well as from other agencies of the Federal Government. AMETA offers basic technique courses ranging from 1 to 8 weeks in duration in subjects such as Reliability and Maintainability, Economic Analysis for Decision Making, Management Statistics, Methods-Time Measurement (MTM), Quality Control Management, Principles and Application of Value Engineering. Additionally, appreciation courses and executive workshops are offered to provide an overview of the latest principles and techniques particularly to mid and top management personnel.

AMETA provides an 8-week course in Work Methods and Standards which is designed for persons presently engaged in or soon to be assigned to methods study and work measurement activities. This course gives the enrollee the working knowledge necessary to perform the duties of a technician. The program of instruction includes Cost Analysis, Work Sampling, Value Engineering, Process Analysis, Operations Analysis and Multiactivity Analysis. It places emphasis on engineered and nonengineered standards and a portion of the course is taught by a qualified MTM instructor licensed by the MTM Association.

To provide supervisors with an appreciation of the basic elements of methods study and work measurement, AMETA presents a 1-week Work Methods and Standards Appreciation Course.

For commanders and lieutenant colonels and above and GS–14s and above, AMETA presents a 2-week top management seminar. This is designed for those who are either in positions requiring management improvement programs or who have capability for moving to such responsibilities. The seminar provides an up-to-date program designed to stimulate thinking, discussion and action relating to managerial problems and environment.

Logistics Management Center

The Army Logistics Management Center (ALMC) is located at Fort Lee, Va. Since its beginning in 1954 with one course, the Center has grown to where it conducts 22 courses. Eleven of these are designated as Defense management education and training courses and the other 11 are concerned with the Army subject matters. ALMC is particularly proficient in the areas of supply, depot operations, requirements, distribution and procurement.

The Defense Inventory Management Course at ALMC extends for 6 weeks and is available to commissioned officers in the grade of first lieutenant, lieutenant junior grade and above and civilians GS–7 and above. This course seeks to develop and increase understanding of officer and civilian managers who are concerned with materiel inventories. It concentrates on wholesale level logistics. The program of instruction includes the organization of the DoD supply systems, the research and development of new items, requirements determination and computation, management of inventory through tools such as financial management, economic inventory and order quantity concepts, etc. Problems in human relations and the application of management skills and practices, communicative skills, decision making and problem solving techniques appear throughout the course emphasizing their importance to management.

The senior course at the ALMC is the 12-week Army Logistics Management Course. This course is available to Army captains and lieutenants senior grade and above and to GS–11's and above. It provides advanced level logistics management education to officer and civilian personnel assigned to key positions of responsibility in the Army wholesale logistics system. The curriculum considers the top level management aspects of wholesale logistics including the application of scientific management techniques for initial planning, programing, budgeting and requirements computation through procurement, distribution, maintenance, financial and other controls to the ultimate disposal of surplus stocks.

Systems and Logistics

The Air Force School of Systems and Logistics (SOSAL) is a resident school of the Air Force Institute of Technology which is a component of the Air University command. The school is located at Wright-Patterson Air Force Base. Its particular areas of proficiency are production, procurement, maintenance and cost analysis. The school provides about 35 short courses in specialized subjects. Of these, 20 are designated as Defense management education and training courses and include subjects such as Contract Administration, Maintenance Management and Information Systems, Production Management, and Cost Analysis. Courses that are Air Force peculiar include Initial Provisioning, Engineering Data Management, and Base Procurement.

The Contract Administration Course at SOSAL extends for 4 weeks and is designed principally for civilians and officers who are assigned as administrative contracting officers. The course aims to further their basic knowledge and skills in the management of government contracts. It is oriented toward central procurement and emphasizes the relationships between contract management and contract administration by treating in depth such subjects as Contract Law, Production, Quality, Price and Cost Analysis, Accounting and Industrial Property.

Additionally, the School of Systems and Logistics provides a graduate logistics management program which extends for 12 months and leads to a Master of Science Degree in Logistics Management. While designed principally for Air Force military personnel, civilian personnel of the major air command may also apply through their civilian personnel training channels. In fiscal year 1967, seven civilians were awarded the degree. Applicants for the graduate logistics management program are required to take the graduate record examination aptitude test. The curriculum is heavily weighted in quantitative subject matter. The subjects covered include economic analysis, statistics, systems analysis, financial management, as well as specific logistics functions.

Computer Institute

The Department of Defense Computer Institute (DODCI) was established in Washington, D.C., to provide joint orientation courses in the specialized field of computers. The Institute conducts courses to teach the fundamentals of digital computers and assists military and civilian personnel in planning the implementation of computer systems.

A 1-week senior executive course for general/flag officers and for civilians in grades of GS–16 and above is given. The course provides a comprehensive view of the computer field.

A 2-week intermediate executive course is available for officers in the rank of Navy commander and captain or lieutenant colonel and colonel and for GS–14's and 15's. This is a more detailed course than the senior executive course, getting more involved in computer and programing fundamentals.

A 3-week Command and Control ADP Systems Course is available for Navy lieutenants through commanders or captains through lieutenant colonels and GS–14's through 15's. This course is designed for those assigned to command control ADP duties.

Navy Management Systems Center

The U.S. Navy Management Systems Center was established at the Naval Postgraduate School, Monterey, Calif., to provide two Defense courses in Defense management systems. The 1-week course is for flag and general officers and for civilians of comparable grade. The 4-week course is designed for lieutenant colonels and commanders and above and GS–13's and above. The purpose of the course is to provide an overview of general management concepts as applied to Defense management systems (i.e., planning, programing, budgeting, and related activities). Emphasis is placed on the analytical aspects of management, including requirements studies, systems analysis, cost effectiveness and cost estimating and analysis. This course has served as a model for the development of various courses used in civilian educational institutions and has been presented to civil agencies of government and to many of our Allies.

IDA

The Institute for Defense Analyses (IDA) conducts the Defense Systems Analysis Education Program for which the Secretary of the Navy has executive responsibility. Although the program is currently given in cooperation with the University of Maryland, it is anticipated that other universities will become involved for the next session. The program includes 30 semester hours of graduate study and the degree of Master of Arts in Economics is awarded to those students who meet all degree requirements. The IDA curriculum includes intensive training of military and civilian

The Industrial College of the Armed Forces, located at Ft. McNair, Washington, D.C. is the capstone of the military educational system in the management of logistic resources.

personnel in the techniques of the planning, programing and financial management system and stresses economic analysis as a tool to contribute to the decision making process. The courses include mathematical analysis, microeconomics, macroeconomics, econometrics, defense policy, probability and statistics, and operations research. The program extends for 14 months and produces highly qualified specialists.

ICAF

In addition to the kinds of management education and training opportunities illustrated above, military and civilian employees in limited numbers may qualify for attendance at the Industrial College of the Armed Forces. This school is the capstone of the military educational system in the management of logistic resources. It is located at Fort McNair in Washington, D.C., and conducts a highly successful nonresident program as well as a resident curriculum.

ICAF's curriculum extends for 10 months and includes courses relating to the economic and industrial aspects of national security. It considers interrelated military, political and social factors and provides instruction in executive development and scientific decision making. The correspondence course, "National Security Management" (based on the resident course) and a shorter correspondence course, "Management in the Department of Defense," are offered to both military and civilian personnel.

Job Training and Correspondence Courses

In addition to the resident instruction programs, many opportunities exist for on-the-job training and development through correspondence courses. The relatively limited capacity of resident schools to meet the Defense requirements has resulted in increasing nonresident programs which parallel the resident programs. A variant of the on-the-job training includes programs which train instructors who are selected by an installation to attend a management school. These instructors return home to teach the course under the monitorship of the school. Thus, in areas such as the Defense Integrated Management Engineering System (DIMES) program industrial methods engineering training is actually being brought to the installation through instructors trained at a school who return as qualified teachers.

Civilian Career Executive Institute

Recognizing the need for providing more opportunity to senior civilian employees to enhance their management capabilities, the Department of Defense has under consideration the establishment of a Defense Civilian Career Executive Institute. If funds for this purpose are appropriated, the Institute would present approximately an 18-week program concerned with Defense oriented executive development education. This Institute would be designed for GS–14's and above and would also include a small number of military students. The curriculum would be Defense oriented and individuals with outstanding records of performance and recognized potential for further development would be selected to attend.

Thus, aware of the constant need to stay abreast of modern management needs, the Department of Defense provides an opportunity for training at all levels for its military and civilian personnel. Resident and correspondence programs exist to improve the preparation of people for their jobs and to upgrade them for higher responsibilities. Commanders and personnel officers have a broad spectrum of courses from which to choose as they seek to foster efficiency in the management of the Defense establishment. □

Job Finding Systematized, Simplified and Speeded Through DoD's CENTRALIZED REFERRAL ACTIVITY

DESC officials discuss progress of both the Automated Priority Placement and Overseas Returnee Placement systems. Reviewing latest workload statistics are (left to right) John Marvin of the CRA Office, Data Systems director Ralph Smith and Brad Robbins, director of the CRA program.

For Both CONUS and Overseas

A commissary store manager in Glasgow, Mont., recently received notification that his job was being surplused because of an economy move. Obviously, such positions are hard to come by; but coincidentally an Air Force Base in Blytheville, Ark., had a vacancy in its commissary operation for his skill. The activity learned of the manager through the Department of Defense Automated Priority Placement System and within a short time, the displaced store manager found himself on the new job in Blytheville.

Over in Guam, an upholsterer without stateside re-employment rights was preparing to conclude a Civil Service tour of duty and return to the United States. Locating a position of this type could very well be time consuming and unlikely; however, it became his good fortune that a naval activity in San Diego, Calif., needed an individual with his talents. Once again, through the DoD Overseas Returnee Placement Program, this employee had a job awaiting him when he landed back on U.S. soil.

How System Works

Similar case histories develop each day at the Defense Electronics Supply Center in Dayton, Ohio, where the Centralized Referral Activity, operates the automated Priority Placement System and the Overseas Returnee Placement System. These systems are a tandem operation with one phase devoted strictly to finding jobs for surplused DoD employees worldwide, and the other to secure positions for DoD Civil Service employees returning from assignments overseas. While the mechanics of each system are somewhat different, the objectives of both the Priority Placement and Overseas Returnee Systems are essentially the same. An eligible interested in placement is registered into the applicable system and referred according to the specific job category for which he qualifies. He selects preferred locations of employment, and vacancies occurring within the Department of Defense activities selected are compared with the skills of the registrant being referred. Stopper Lists and Overseas Returnee Placement Lists prevent DoD activities from filling vacancies, which are suited to the qualifications of the registrant, through other methods. The activity with the vacancy then arranges the transfer or reassignment action with the releasing personnel officer.

Keypunch operator Naomi May converts information arriving from CRA registrants into computer language—the initial step of the highly automated process.

Eldon Shook, chief of computer operations at DESC, explains mechanics of the referral system to two recent CRA placements at the Center: Helen Rogers and Bennett Andrews. Processing information at the computer console is operator Anna Tibbs.

Mailing stopper lists to defense activities is a major operation. Processing the documents are (right to left) Helen McRoberts, Anna Johnson, Betty Wilkinson and William Iddings of DESC's Data Systems Office.

35,301 Referrals Since 1965

Since the stateside Priority Placement System went into nationwide operation on 1 March 1965, a total of 35,301 displaced defense workers have been referred by DESC computers. Significantly, DoD activities thus far have placed 20,874 registrants and deleted another 13,022 through voluntary deletion action or who were no longer eligible as a result of receiving 2 offers or other reasons. Currently, the Priority Placement System has 1,405 registrants' skills being referred for placement consideration.

According to Brad Robbins, director of the Centralized Referral Activity, the input of displaced workers has included 14,165 from the Air Force, 10,730 from the Army, 9,409 from the Navy, 971 from the Defense Supply Agency, and 26 from other Defense agencies. As for replacements, the Navy tendered jobs to 7,278; the Air Force 5,582; the Army 5,189; and DSA 1,180. In addition, other Defense Activities have employed 29, and other Federal agencies outside DoD have placed 1,127. DoD activities have also placed 488 of these registrants in private industry.

A Placement Every 17 Minutes

Robbins calculated that since it began operation, the DoD activities have registered one displaced worker every 10 minutes and made a placement every 17 minutes based on an 8-hour work day.

The Overseas Returnee System is relatively new, having received its baptism in March 1967. As of March 31, 1968, DoD activities have registered 725 overseas returnees, placed 249, and deleted another 200, leaving 276 presently being referred for stateside placement consideration. The tentacles of the Overseas Returnee Placement Service literally stretch worldwide. Registrations are being received from the Far East, Europe, Africa, and the Mediterranean, plus areas in the Caribbean and South Pacific. The countries with the most registrations cumulatively to date are Germany 136, Japan 90, Philippines 69, Korea 61, Vietnam 55 and Guam 44. A variety of skills are being registered, such as Finance Officer from Greece; Contract Specialists from Vietnam; General Engineers from Morocco; Chemists from Cuba, and many others. Robbins noted that overseas returnees are being placed throughout the United States from the east coast to the west coast, including several placements in Alaska and Hawaii. □

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PROCUREMENT CAREER DEVELOPMENT 1962–68

The Years of Growth

ROBERT D. LYONS

Director Procurement Management, Office of the Deputy Assistant Secretary of Defense (Procurement) OASD (I&L)

WE HAVE INITIATED within the Department of Defense a DoD-wide Civilian Career Program for Procurement Personnel—a completely different concept unique in its imaginative challenge to routine personnel patterns and practices in many important areas—not the least of these is represented by a DoD-wide computerized inventory and referral system for selection of key personnel.

In authorizing the Procurement civilian career program, Secretary McNamara stated that "it is essential that recognition be given to the men and women responsible for this important function, that they have adequate opportunities for improved career specialization and promotion—and that we take those actions necessary to assure, on a continuing basis, that qualified men and women are available to carry out these functions in the Department of Defense."

In his keynote address to the 1967 DoD Procurement Pricing Conference at Hershey, Pa., Secretary of the Navy Paul R. Ignatius highlighted the most vexing and persistent problems of the procurement manager in this way:

> "In the final analysis it is the capability of our people that determines the level of effectiveness of our operations. Are the changing characteristics and increasing demands of the job being reflected by the available range of job specialties, in the job qualification standards, in the training opportunities, in formalized trainee programs, in grade levels, and in career progression opportunities?
>
> "We can devise and refine new policies or techniques or contracting methods indefinitely but unless we have developed qualified, competent and motivated people to use these tools intelligently and with understanding, the efficiency and improvements to be achieved are limited by the quality, experience and dedication of the people available to do the job."

Background

The first major effort to identify and resolve the problems of procurement management was a procurement conference held in Williamsburg, Va., in 1962. Seventy-five recommendations were made by the Williamsburg conferees in the area of contract management, procurement policy, procurement training and career development. Many significant developments had their beginning as Williamsburg recommendations. For example:

- The Defense Contract Administration Service was created to improve the management of contracts in the field.
- The Defense Contract Audit Agency was created to provide auditing uniformity.
- The Procurement Management Review Program was instituted to determine how well procurement objectives and our policies are being carried out.
- The Defense Procurement Training Program was initiated as the first attempt to establish, through DoD-wide joint training, uniformity of understanding of DoD policies and practices.

There were many others but for the purpose of our dissertation the Procurement Management Review Program and joint training were important forerunners to the creation of a definitive procurement career management program. The need for a DoD-wide, well-structured, training program as an integral part of a DoD career program is obvious. The degree to which such a training program is responsive to developing the requisite skills and knowledge essential to effective and efficient operation, however, is not so obvious. The fact that our initial efforts in this area were less than wildly successful was surfaced as a result of the Procurement Management Reviews which was expressed in this wide variety of challenges.

- "The inadequacy of training of top and middle management procurement personnel has been observed in many reviews."
- "The usual reason given by operating personnel is that workload is too heavy—and that travel funds must be assigned to more important areas."
- "Neither time required nor overall manpower requirements recognize the need to accomplish the procurement mission."
- "Students are assigned by the local commander on a 'he won't be missed' basis."
- "College graduates are offered a starting salary below that of the noncollege level."
- "In the military it is the 'kiss of death' to be assigned to the procurement function."
- "The last five ACO's assigned to this activity had no prior experience."

As a result the Secretary of Defense requested that a profile be compiled of our senior procurement personnel. The results:

1. Analysis revealed that the typical military officer had limited procurement experience, and that his future assignments would very likely not be in the procurement field.

2. Officer rotation patterns worked against acquiring and utilizing extensive procurement expertise. However, nearly all key procurement slots are reserved for military officers. Thus, the potential for civilian growth is denied the management opportunity in most cases.

3. The typical civilian, on the other hand, had many years of experience in one activity; a low formal education level; entered the service during World War II and is now approaching the retirement age; has never attended a formal training course in his area; has been a GS–12 for 12 years with little opportunity for advancement.

As could be expected, the Secretary of Defense ordered the development of a career program designed to elevate the Defense procurement function to a level approximating parity with its Industry counterpart.

Details of the Program

The program applies to all positions in the procurement career field—equally applicable to those presently in the Civil Service Commission series as well as those who are qualified for these positions.

Recognizing the magnitude of the problem, the inventory and referral system started with those eligible for promotion at the GS–14 level. The Air Force has been requested to provide, on a phased basis, for future DoD-wide referrals at the GS–12—senior journeyman—level with registration and inventory capability at all grades (GS–5 and above).

The Central Automated Inventory and Referral System (CAIRS)

The purpose of the DoD-wide inventory and referral system will be to:

(1) Refer and aid in the selections of personnel at the GS–14 (ultimately at GS–12). (A recent modification will provide for selection from the top 50 candidates from the referral list or any other qualified individual with the approval of the Head of a Procuring Activity. This change is designed to allow the selecting official greater freedom to consider all qualified individuals.)

(2) Conduct research, analysis and planning studies. (The present plan to include all procurement personnel in procurement (i.e. GS–5 and above in the GS–1101, 1102, 1103, 1150 as well as those qualified for promotion in these series) will provide for the first time a statistical basis for evaluating and projecting our training and recruitment requirements for the future.)

At present there are 3,276 persons registered under the Central Automated Inventory and Referral System (CAIRS) at Hill Air Force Base, Ogden, Utah. As of November 1967 there were 98 position vacancies throughout the Department of Defense which used the CAIRS listing for selection and referral. Only 31 employees have remained in essentially the same organization and did not move geographically. This seems to indicate that one of the principal objectives of the program—mobility of civilian personnel—is being achieved.

Training and Development: The Procurement Master Development Plan outlines formal training courses available to employees for development and improvement of technical knowledge and skills. Courses are specified for the trainee or entry level (GS–5 through GS–8), the intermediate level (GS–9 through GS–12), and the senior and executive level (GS–13 and above).

Courses are categorized as either mandatory for advancement, mandatory when required by the mission of the procuring activity, or highly desirable. An em-

ployee who has not had the opportunity to receive mandatory training may be promoted if:

a. He satisfies equivalency training requirements, or

b. He is scheduled to take the mandatory training within 12 months after his promotion.

However, it should be obvious that, all other things being equal, the applicant who has completed the mandatory training is going to be selected.

Recently the Procurement Career Management Board was formed to review all logistics courses to determine their compliances with the objectives of the program.

Career Appraisal and Counseling: Career appraisal must be conducted at least annually in accordance with prescribed procedures. Appraisal and counseling sessions are designed to provide each employee with a planned program for career development, keyed to his demonstrated abilities and potential for advancement. In other words, this aspect of the program meets the basic "human relations" requirement to let a man know how he's doing, what he can do to improve, and what he can expect or strive for in the future.

Supervisors must appraise each of the subordinate's *potential* capabilities in terms of seven different elements: both oral and written communication; technical competence; supervision and administration; cooperation; quantity and timeliness; and stability. Appraisal ratings are assigned for each element on a whole number scale ranging from 0 (unsatisfactory) to 4 (outstanding).

During the counseling interview, the supervisor will discuss his appraisal of the employee's performance and potential with the employee. Then the two jointly develop the career goals of the employee, in terms of future job assignments, future duties, rotational job assignments, etc. Once the career goals are determined, the activity Career Advisor enters the discussions, and the training needs of the employee are determined, based on his previous experience and training, his appraised potential and his career goals. The training needs are developed into a training plan that is consistent with the employee's ability and goals and with the activity's programed objectives and available training resources.

The foregoing may extend over more than one interview, but the entire career appraisal and counseling process for each employee should normally be completed in 1 or 2 weeks. As noted above, it *must* be accomplished at least annually. A DoD form has been developed to facilitate recording the supervisor's appraisal, the employee's career goals, and the training and development plan, plus pertinent comments of the employee, the supervisor, and the Career Advisor.

The Selection Process

When a procurement vacancy is to be filled, selecting officials will forward a request for referral listing to CAIRA (Central Automated Inventory and Referral Activity), with copies of the official position description and other pertinent data. The request will specify (a) screening criteria to be applied in selecting eligible personnel and (b) criteria for ranking these applicants.

The selecting activity may choose to impose only the minimum Civil Service requirements for selecting eligible personnel. Or it may impose additional requirements, which must be expressed in terms of experience or training. To illustrate the degree to which requirements may be defined, consider just the experience factor. The desired experience may be expressed in terms of time requirements; requirements for experience in a particular function, specialty, or commodity; recency of experience; amount of supervisory experience required; or other selective types of experience.

Originally, ranking of eligible candidates was based on career appraisal ratings and either quantity of experience alone (referred to as option I) or a combination of quantity of experience (up to 7 years) and pertinency of experience rating (referred to as option II).

Recently, as a result of an in-depth evaluation of the program, both option I (length of service) and appraisal ratings were eliminated from the ranking pro-

With Carl W. Clewlow (left), Deputy Assistant Secretary of Defense (Civilian Personnel Policy) and Clair Frischknecht (right), Chief, Central Automated Inventory and Referral Activity as interested observers, William M. Russell of the CAIRA staff sets the computer in motion to obtain referral data used in selecting career procurement personnel from the 3,276 names included in the CAIRA inventory.

Jan Hall (left) and Deanna Daffin, CAIRA employees, check over the referral lists as the names of qualified procurement personnel are processed through the Central Automated Inventory and Referral System, Hill AFB, Utah.

cedure. Today only pertinency of experience is used for ranking purposes.

CAIRA will forward the ranked listing of eligible candidates and all recorded data concerning these candidates to the requesting activity, and at the same time will send each of the candidates a brief description of the vacancy, its location and duties. Each candidate also receives a form to be filled out and air-mailed to the selecting activity, indicating whether he is "available" for the position.

The selecting authority may consider, up to a maximum number of 50, each eligible candidate on the referral listing who has indicated availability. Candidates not on the referral listing may also be considered. However, a candidate not on the referral listing may be selected—as mentioned above—only if the head of the Procuring Activity approves written justification for the selection. The justification must clearly show the basis for not selecting any of the applicants on the referral listing.

Further actions are required when filling GS–16 through GS–18 vacancies. For these positions, a screening board will:

a. Review the criteria established for filling the position;

b. Review candidates' qualifications;

c. Either concur in the selecting official's recommendation or furnish him a roster from which selection must be made.

A possible weakness in the system may be in this area. As of today, no supergrade referrals have been submitted to CAIRS.

Problem Areas

Test runs have indicated that proper structuring of referral requests will be one of the most difficult requirements of the new program. The system encourages filling vacancies from referral listings. *Hence it is essential that senior management officials in both the procurement and personnel fields carefully consider the tailoring of criteria for selecting and ranking eligible applicants.* These criteria must conform to actual requirements if the referral listings are to be made up of those applicants who are truly most qualified to fill the position.

Difficulties are anticipated in other areas. For example, prompt and accurate determination of applicants' availability may be a problem. Furthermore, the initial inventory of procurement personnel resources included too few personnel in the "other series" positions, where 50 percent or more of the responsibilities are related to procurement. Coverage of individuals whose background experience qualified them for procurement positions was also less than desired.

Nevertheless, as problems arise they are being worked out. Implementation of the overall program is proceeding at a rapid pace.

Summary

As a result of a recent evaluation, the following recommendations have been made to Defense management to accommodate improvement. This would include:

1. (a) Specifically identifying the procurement intake requirements.

(b) Insure the assignment, in an orderly and uninterrupted manner, of individuals coming into this and other related career programs.

2. Make fuller use of within-grade merit increases to achieve a measure of deserved salary comparability with industry. This technique, which is readily available, is often overlooked by managers. Such a technique to be useful requires better direction and understanding.

3. Provide for periodic examination or review of position classification programs to insure:

(a) Uniformity of position classification throughout DoD, and

(b) that existing classification standards are revised as necessary and as recommended by DoD functional managers.

4. Develop (in conjunction with DoD (Manpower)) supporting documentation necessary to secure Civil Service Commission authorization to provide for grade levels for negotiator-price analysts above minimum entrance salary levels.

5. Ascertain and augment as necessary existing pools of funds and spaces now being used for long term education and training (over 120 days) to accommodate procurement requirements.

6. Insure better understanding and implementation of all aspects of the DoD-Wide Civilian Procurement Career Program by all levels of procurement.

7. Devise methods to increase the amount of rotation and cross-training of individuals in the related functional areas of contract audit, contract administration, etc.

8. Provide that qualified officers get directed duty assignment in procurement.

9. Provide for retention of qualified officers in assignments for a minimum of 2 years, and if possible, 3 years.

10. Support legislative efforts intended to establish comparable wages and fringe benefits with the private sector.

11. Initiate improvements to insure adequate management attention and resources support validated training requirements.

I believe that implementation of the above and the further refinement of the objectives of the DoD-Wide Procurement Career Program provides the necessary framework to accommodate improvement and increased effectiveness with an attendant gain in mission capability. A better chain of career progression in the procurement category is the reward. □

The Total View

Adapted from an address at The Electronics Industries Association Symposium of March 7, 1968, at Washington, D.C.

By **THOMAS D. MORRIS**

Assistant Secretary of Defense (Installations and Logistics)

I WOULD LIKE to relate to you a viewpoint which was on Secretary McNamara's mind as he left office. In the concluding weeks of his Secretaryship, he devoted considerable time to reviewing, in retrospect, the effectiveness of the major reforms in Defense procurement and weapons acquisition which had taken place during his administration. He was extremely proud of these reforms and of industry's statesmanlike support of them. But he was also interested in assessing whether the impact of greater fixed-price contracting, keener competition, and more disciplined management of the acquisition process had in any way placed an unfair burden on industry. In a final memorandum to Service Secretaries entitled, "DoD Relationships with Defense Contractors," he cautioned Defense officials to be alert to possible misapplication of Defense procurement policies, and he called attention to the following areas of possible misapplication:

—Improper cost sharing in R&D work.
—Improper dissemination of technical information among competitors during the contract definition process.
—Inadequate contractual coverage of work which contractors are requested or required to do.
—Misuse of firm-fixed-price contracts where there are numerous development and production uncertainties remaining.
—Tardy processing of value engineering changes.
—Unrealistic negotiated profit rates.
—Excessive administration by the government of contractor performance under high risk contracts.

In concluding his memorandum, Mr. McNamara stated, "The Defense industrial base is a vital and indispensable asset to our nation. While concern for the public interest must always be our basic and primary concern, nevertheless we must assure that fair and equitable practices govern the buyer-seller relationship."

Total Cost—Total Effectiveness

I mention this very interesting memorandum because I think it important that we make it clear to you that in enlisting industry support of the concept that we have come to describe as "Integrated Logistics Support," we are not trying to invent a new way of forcing our contractors to assume new cost penalties or financial risks. Rather, I view our objective in this program as that of learning and applying lessons gleaned from our mutual experience in the maintenance and support of weapons systems. These lessons should teach us what actions are required during design and development in order to simplify the operation and support of our systems downstream—that is, when they reach the hands of the soldier, sailor and airman—and particularly when these men are under the stress of combat.

The Air Force recently had a very illuminating experience when it put a modified T–37 trainer aircraft through operational tests as a tactical weapon system in Southeast Asia. The A–37 has proved to be superb—capable of operating at intense surge rates for prolonged periods, with minimum maintenance and turnaround time. When Mr. McNamara was briefed on the results of the test of this aircraft in Vietnam—and was informed of the rapidity with which pilots and maintenance crews learned to use it with unusual effectiveness—he commented, "This teaches us an important lesson about the value of simplicity in our hardware."

This experience does *not* suggest that we should relax the search for greater capabilities, through exploiting advancing technology, simply to achieve simplicity. But it does dramatize a lesson which I believe we are learning in many fields in Vietnam—namely, that those of us concerned with design, development, procurement, production, supply, and maintenance must continuously keep in mind the needs of those who will operate, supply and maintain the equipment—and consciously

(*Continued on page 32, VIEW*)

STICS SUPPORT

Its Necessity and Accomplishment

By **FINN J. LARSEN**

Principal Deputy Director
Defense Research and Engineering

Excerpted from an address at the Electronics Industries Association Symposium of March 7, 1968, at Washington, D.C.

THE TOPIC TODAY IS ILS. Let us examine our accomplishments, our policies, and the direction of our progress. Let me give you some specifics. We have in being a number of policies and practices that promote improved logistics support; for example, the Concept Formulation/Contract Definition policies enunciated by DoD Directive 3200.9. It is clearly the intent of these policies that logistics be considered early in the conceptual stages and that logistics be a major factor in contract definition and development. One prerequisite of Engineering Development is that the remainder of a program be engineering rather than research—that the technology be well in hand before an engineering or operational systems development program is launched. This prerequisite is aimed at a number of objectives, including the prevention of major logistics support problems. Another fundamental aspect of the Concept Formulation/Contract Definition policy is that system trade-offs be made. I quote:

"Trade-offs should be used to obtain, with the mission and performance envelopes, an optimum balance between total cost, schedule, and operational effectiveness for the system. In this context, . . . operational effectiveness includes all factors influencing effectiveness in operational use (such as "pure" performance, reliability and maintainability); and system includes the hardware itself and all other required items; such as facilities, personnel, data, training equipment, etc."

DDR&E Policies for Logistics Support

The current DDR&E policy on reporting of major developments (outlined in DoD Instruction 3200.6) provides for TDPs—Technical Development Plans—and requires that the plans include information on:

- Operational information that affects reliability and maintainability design.
- Planning information needed for reliability and maintainability design.
- Plans for a reliability program outlining how reliability will be achieved.
- Plans for a maintainability program outlining how maintainability will be achieved.

Quantitative information on characteristics such as turnaround time, planned utilization rate, mean time to return to service, and minimum allowable time between schedule maintenance is also expected to be provided in the TDP.

The DoD policy on System Project Management (DoD Directive 5010.14) references the ILS Directive (4100.35) and states:

"Logistic support planning shall be accomplished concurrently with other system/project effort. The logistics organizations identified in the System/Project Manager Charter and in the approved, negotiated System/Project Master Plan will assist the System/Project Manager in support planning and in developing transition agreements."

DDR&E has actively engaged in the generation of several DoD Standards that promote more effective logistics support. These include Mil-Standards 470, 471 and 785 dealing with maintainability program requirements, maintainability demonstration, and a reliability program.

In the list of policies and practices that currently exist, I want to mention a very important directive . . . . This is the DoD policy on the use of microelectronics in military equipment and systems. This policy requires that all new projects in Advanced, Engineering and Operational Systems Development "consider the use of microelectronics technology in their design . . . with the view of maximizing reliability and minimizing total cost of ownership . . . ." That policy is expected to have a major impact on maintenance and logistics support. Throughout this policy, concepts such as "module discard-on-failure" and "logistics self-support" will be used much more extensively. I am confident that increased use of microelectronics will result

(*Continued on page 34, NECESSITY*)

(*VIEW, continued from page 30*)

seek to meet these needs. It illustrates to me that in preparing our cost-effectiveness analyses, we must include in the "cost side" of the equation the cost of supply, maintenance and down time; and that we must include in the "effectiveness side" of the equation the value of greater operational up-time, and longer mean-times-between-failure.

Long-Range View Essential

DoD Directive 4100.35, the charter for integrated logistic support, makes it clear that in addition to a plan for the operational performance of a new system, there needs to be a companion plan for its logistic support. As development proceeds, these plans must be constantly meshed if the system is to achieve optimum effectiveness.

All of us have shared a sense of frustration in why it is proving so difficult to translate this obviously desirable and fundamental concept into reality. Our procurement people have undoubtedly shied away from proceeding too quickly because of their reticence to increase procurement costs, without the ability to clearly foresee and predict the logistic economies which may emerge over the programmed life of a new weapons system. These are, of course, valid fears. The fact that the Directive states that the costs of developing integrated logistic support "shall be recognized as inherent in the overall cost for delivery of an operationally effective system . . ." does not by itself alleviate these fears. I suggest that the best way to overcome this reticence is to have a convincing demonstration, by documented cases, of the costliness of our failures to apply ILS concepts; and of the values of insisting upon the proper marriage of the operational plan and the logistic support plan in new systems.

Examples Support ITS Concept

It is for this reason that I have been goading myself and my associates to seek out evidence which will be so dramatic that every skeptic among us, and among those who will be quick to criticize us, can be made a convert. I was recently furnished several examples illustrating the essentiality of full application of the integrated logistic support idea.

1. In one case, the airborne digital computer of the fire control system of the F–106 aircraft began requiring excessive support resources. Redesign of this 1956 state-of-the-art system resulted in estimated annual savings—in terms of maintenance man-hours and logistic support costs—in excess of $3,500,000. The 200,000 maintenance man-hour savings annually are significant in themselves. The high cost of repair, and the obvious change in state-of-the-art, were the motivating factors here. It would be interesting to know how many more systems are approaching this status. They would certainly seem to offer a fertile field for exploration.

2. In the case of the F–111, it was recognized that, because of its unique characteristics, the F–111 would benefit from a continuing analysis and evaluation of support requirements prior to completion of the engineering/design phase. Fifty-four specific design changes were made to improve equipment support and to achieve the goal of 35 maintenance man-hours per flight hour. Overall savings attributable to these improvements are almost $92 million.

One of the design changes eliminated 250 rivets in the engine inlet shield, thereby precluding possible foreign object damage. While it may cost more to produce the revised inlet shield, the offsetting benefits in reduced repair time and increased operational time are substantial. I wonder whether more such improvements could have been conceived if logistic support had been given greater consideration during the early conceptual phase of the program.

3. Grumman has reported a very interesting case based on contracts it had for two aircraft requiring carrier space—the A6A and the E2A. The critical manpower requirements and limited space were prime constraints. This gave Grumman the idea of designing common support equipment for the two aircraft. Perhaps we should deliberately seek to impose more such logistic restraints during the design stage in order to cause explicit consideration of the logistic support environment. The concept of common test equipment, tooling and facilities might be applied generally to airborne equipment, motor vehicles, ordnance items, and ships programs. I understand there is an intensive effort in this direction under way in one military service.

4. The redevelopment of the Hawk to accommodate the Wooden Round concept has some interesting features that warrant careful observation. The objective of this concept is to design an anti-aircraft guided missile that will not require any operation or power applied prior to launch. This no-support is required at organizational or field levels, with a sharp reduction in maintenance manpower and space requirements. This is what we are trying to achieve.

The Hawk illustration also represents the redesign of existing equipment, and the ability to incorporate new ideas based upon actual experience with a system. It would seem that redevelopment programs to extend the life of equipment between overhaul, or perhaps eliminate the need for such overhaul during its life cycle, represents a significant opportunity to conserve logistic support resources.

5. Another interesting development that has been taking place, particularly in the electronics industry, is the plug-in type component modules facilitating replacement in the event of failure. Obviously, the down-time of a system using such modules is negligible. This is a tremendous development that has been possible only as the state-of-the-art has progressed through miniaturized, solid state circuitry.

The illustrations I have given were obtained by an Industry-DoD Task Team. One can hardly look at such illustrations without wondering whether we should be seeking systems requiring "no maintenance." For example, is the possibility of a 4,000-hour "no overhaul" aircraft worth considering? What would it cost? Would the development and production costs be prohibitive; *or* would they be reasonable in relation to the support resources saved and the increase in hours available for operational use?

Which components of our systems should designers attack first so as to reduce support time and costs? To what extent can the "plug-in" module concept of repair now used in electronics be extended to other components?

The pay-offs from Integrated Logistics Support are of such magnitude that we must obviously do a more effective job of analyzing and planning at the outset of new weapons programs. In addition to stressing logistic support during the conceptual and design phases, we should also be seeking more effective use of existing support facilities, equipment, and resources through product improvement programs for existing major systems.

The Office of the Secretary of Defense and the Military Services are working on these and other ideas.

The Office of the Director for Defense Research and Engineering is preparing Development Concept Papers on every major development program. These papers incorporate consideration of production and logistics support matters during the program approval process. This is a major step forward.

A task force under the Joint Logistics Chiefs is now at work on procedures to assure that logistic support arrangements for multi-service aircraft are thoroughly considered during the design and development stage.

A document entitled, "DoD Systems and Equipment Integrated Logistics Support Planning Guide," promises to provide important procedural knowledge for DoD managers. It will be available to industry, and, in fact, is being reviewed right now by the Electronic Industries Association.

An Industry-DoD Integrated Logistics Support Committee is being formed. This group has been asked to work with us for the next year to further illustrate the benefits that can be achieved through Integrated Logistics Support, and to develop recommendations affecting the contractor-customer interface. We expect much from this group.

In conclusion, I wish to pay my compliments to the efforts of the many members of industry who have already assisted us in making progress in this field. I assure you that it is the objective of those of us in OSD and in the Military Services to act upon the results of this work and to foster continued efforts with industry. In summary, we need no more authority and directives to hasten our progress, but we do need greater understanding on the part of all concerned, and practical proof of what can be accomplished. □

PLANS SET FOR FOURTH ANNUAL AIR FORCE/INDUSTRY COST REDUCTION AWARDS CEREMONY AND WORKSHOP

The Air Force/Industry Cost Reduction Steering Committee has completed plans for the Fourth Annual Air Force/Industry Cost Reduction Awards Ceremony and Workshop to be held on 3 October 1968 at the International Hotel, Los Angeles, Calif. At its planning meeting held 19–20 March at the Air Force Systems Command's Contract Management Div., the Steering Committee announced that the program will include a keynote address by Mr. Hugh Witt, Deputy Assistant Secretary of the Air Force (Installations and Logistics). Three working panels will discuss ideas and problems in Value Engineering Change Proposals; Organization for Cost Reduction and Motivational Programs; and Stimulating Cost Reduction Activity. An outstanding speaker will be featured.

The evening's events will spotlight top Air Force speakers and an awards ceremony. The awards, which are given annually, recognize contractor employees who have submitted significant validated cost reduction ideas during the preceding fiscal year. A maximum of 20 ideas will be selected for recognition.

1968 Air Force/Industry Cost Reduction Steering Committee: Left to Right: Front Row: Mr. H. H. Huber, Hq. USAF; Col. W. C. Robinson, Deputy Director of Procurement Policy, Hq. USAF; Second Row: Mr. B. J. Kerrigan, General Electric; Mr. Mel A. Running, Boeing; Mr. V. B. Von Sonn, McDonald-Douglas; Mr. James McKechnie, Martin-Marietta; Mr. John Snider, Hughes; Third Row: Maj. Kaye H. Herzer, Hq. USAF; Mr. Kenneth W. Hornor, Northrop; Mr. H. J. McKay, AFCMD; Lt. Col. R. K. Dewberry, Hq. AFSC; Mr. J. M. Abett, Lockheed; Mr. W. S. Urquhart, North American; Last Row: Mr. R. L. Strode, AVCO; Mr. T. H. E. Winshurst, OSD; Mr. Robert K. Floyd, General Dynamics; Mr. Harry Tumidajewicz, Aerojet-General; and Mr. Kenneth C. MacDonald, General Motors. Not pictured is Maj. J. S. Prowell, Hq. AFLC.

(*NECESSITY, continued from page 31*)
in major improvements in both operational performance and in logistics effectiveness.

Examples Show Success

We have been talking about policies that will lead to improved logistics. How have these policies worked? Have they reduced or simplified maintenance, reduced personnel or training requirements, or improved some other aspect of logistics? A good and very recent example of the effect of these policies is the FDL ship Contract Definition in which there was great emphasis on life cycle costs and cost effectiveness. During the Contract Definition, the civilian crew requirements were reduced from 52 men to 37 per ship as a result of trade-off studies to optimize the complete ship system for its anticipated life. An example of the results that can be achieved in hardware design is the C–5A landing gear. During the course of the landing gear design, there were a number of decisions made that clearly will improve logistics. For example, an initial design approach to the kneeling mechanism was a complex series of spur and worm gears. Under the pressures of the total package contract to provide lighter weight and more reliability, the design was changed to a very simple chain drive actuated by an air motor. It is expected that reliability and maintainability will both be improved and the number of spares procured will be reduced. Another decision during the landing gear design was to scrap a concept that would have made wheel removal difficult and go to an entirely new design. This was a major and expensive change that will improve C–5A supportability. Another example in the same aircraft is the change from conventional mechanical couplings in the hydraulic lines to sleeve welding. The welding creates a more leakproof joint over the lifetime of the aircraft and will reduce maintenance.

Plans for the Future

Let us consider the second part of the topic—what is our direction? I believe that there are several activities that DDR&E is working on to improve the effectiveness of logistics support:

- A policy on systems engineering.
- A policy on configuration management.
- A policy on reporting of major development programs including requirements for Technical Development Plans.

A (Work Breakdown Structure) WBS policy and standard currently under consideration recognize the importance of Integrated Logistic Support by accommodating the elements of ILS in the Summary Work Breakdown Structure. However, in line with our desire to integrate logistics planning and requirements in the design process, ILS has not been made a separate item in the WBS. Rather the individual ILS elements are expected to be accommodated in WBS elements such as System Engineering, Common Support Equipment, Peculiar Support Equipment, Data, Training, etc.

With regard to system engineering, we are attempting to develop output-oriented (i.e., not proceduralized) systems engineering practices. It is intended that these practices be applied in procurement to insure a completely integrated engineering effort including the integration, by the contractor, of all the support factors (logistics, human factors, etc.). The objective is to adequately consider the logistics support factors during system engineering and design.

Our policy on Configuration Management will provide a maximum degree of design and development latitude, yet introduce at the appropriate time, the degree and depth of control necessary for production and logistics support. We believe that these Configuration Management policies and practices will result in the following benefits to logistics support effort:

1. Fewer changes will occur because of more stringent criteria for evaluating proposed changes, including the impact of all aspects of a proposed change on logistics.
2. Changes to improve logistics will be emphasized since one kind of change permitted is that which significantly improves logistics support.
3. Better knowledge and visibility of the configuration.
4. More orderly implementation of *all* aspects of an approved change, including technical data, training, etc.

There have been significant problems in the past when an engineering change was approved and implemented for the prime mission equipment without accompanying changes in handbooks, test equipment, training, etc.

We are considering a number of changes in the DoD policy on reporting of major development programs that currently requires a Technical Development Plan. Of special interest to this audience is a proposed change to require reference to an Integrated Logistic Support Plan (if there is one) and inclusion in a quarterly report on the status of the project a qualitative rating of four areas: (1) Operational and technical, (2) financial, (3) schedule and (4) logistics. I believe that this will be the first time that a status report on development will put logistics on a equal footing with these other factors.

Some Additional Needs

After having discussed the status and direction of programs related to ILS, let me emphasize a few additional points; First, on each major program, we need to establish a working relationship between the logisticians (including maintenance engineers) and the analysts and designers. And we need to do it early in development.

If the logisticians generate a logistics concept and follow this by a statement of tentative logistics requirements, the designers and analysts can enter into the trade-off studies and analyses that are made in the conceptual phase of development. An early consideration of logistics, and continuing consideration during the development, should achieve the proper balance between operational, economic and logistics factors that is our goal.

Second, we need better data and better tools for an early assessment of the logistics impact. We can do reasonably well in estimating operational performance ("pure" performance), development costs, and to a lesser extent production costs. However, our ability to estimate operational and maintenance consequences, including their costs, is very poor. Related to this is the need to evaluate proposals and make selections by considering the total program, including logistics.

Thirdly, we need to write contracts that motivate the contractor to optimize the total system and total costs. One approach is Total Package Procurement. We will use it when it is appropriate. To establish motivation, figures of merit, or total program measures of effectiveness are needed. An example is the measure used for the FDL ship:

$$\frac{\text{speed} \times \text{payload}}{\text{life cycle costs.}}$$

Lastly, we must train and use logisticians—they must work with the analysts and designers, and must participate in the review of the development program as it progresses.

Reorganization Unnecessary

I want to emphasize a point, on which there may be some differences of opinion between the logisticians and developers. We in R&D believe that the way to get better logistics support is not through a large independent organization that is concerned with ILS, but rather by assuring that the program manager has within his organization the required logisticians. We believe that achievement of integrated logistics support is dependent upon integration of logistics considerations and logistics planning into current organizations and activities, particularly the systems engineering process.

In summary, DDR&E strongly supports the need for Integrated Logistics Support. We believe that effective logistics support can be achieved by early and extensive cooperation between the designers and the logisticians. When the designers and the logisticians make program decisions based on the full military and economic consequences of their actions, the result will be superior force effectiveness. Our fighting men will have weapons that will be effective on the day they are fielded and every day thereafter! □

BATTER UP

Not enough rise in the cake batter? Then it's time to call in the Defense Supply Agency Quality Check Team, operating under the Procurement and Production Directorate of DSA Headquarters at Alexandria, Va.

The team visits installations of the Armed Forces to see how the Agency's materials are faring with their military users.

The problems they encounter run the gamut of DSA commodities. With all problems encountered, it is a case of technicians talking only to technicians—men who speak the same language. The representative from DESC meets with the electronic people, the food man with the mess sergeants, and the industrial man with his counterparts in the maintenance shops.

Since its inception, the Quality Check Program has sent its teams to 36 Army, 34 Navy, 30 Air Force, and eight other activities, including Marine Corps installations, Job Corps and Civil Defense elements. In the process of these visits the teams have picked up a total of 1,164 situations requiring solution.

"There are all sorts of regulations for reporting unsatisfactory material, but none takes the place of a face-to-face interview with the prime user of the product," Colonel Miller noted in summing up the value of his modus operandi.

The cake mix that refused to inflate to acceptable dimensions provides a good example of what the DSA Quality Check people will do when the validity of an Agency product is challenged. On learning from a Navy mess steward about the recalcitrant cake mix, the subsistence team representative reported the matter to Colonel R. J. Miller, USA, and his assistant, Arthur D. Peterson, both of Headquarters, DSA. The problem was forwarded to the Defense Personnel Support Center, Philadelphia for investigation and resolution. In the end, specifications were altered to assure a cake mix that would satisfy all of the military users.

COST REDUCTION CREATES JOBS

Obviously, actions that eliminate unnecessary functions and unessential work or material do reduce costs. Not so obvious is the fact that cost reduction actions may actually create jobs by providing resources for work that otherwise could not be accomplished. The J71–A–13 engine rework program is an example.

The J71–A–13 engine was scheduled originally for phase-out in March 1966. However, the engine was maintained in service well beyond its planned service life because of the situation in Southeast Asia. Consequently, a substantially increased schedule of engine rework was assigned to the Naval Air Rework Facility, Quonset Point, R.I. (NARF) with a requirement for 166 completions during fiscal year 1968. This assignment posed a severe problem of material support since the engine was out of production and both Air Force and manufacturers' stocks of necessary components and spare parts were depleted. New Procurement of the spares would require very long lead times seriously limiting any continued rework of this engine, and would of course be very costly.

NARF representatives, who were working with Air Force personnel toward the solution of this problem, were very familiar with another series engine, the J71–A–2. That engine, obsolete since 1964 and similar in many respects to the J71–A–13 engine, had been declared surplus. The NARF representatives recommended that a comparison be made of the spares used on both engines to determine compatibility. After study, it was determined that considerable interchangeability existed with only a minimum requirement for modification. A program was established for dismantling the obsolete engines and reclaiming the spares.

Ninety-four obsolete engines, which were heading for the scrap pile, are now scheduled for dismantling during fiscal year 1968. It is anticipated that more than 60 critically required spares will be salvaged from each engine. Most of these items are of high cost and would have required a long lead time for delivery.

After dismantling the engines and removing the needed components, the required items are examined and repaired as necessary.

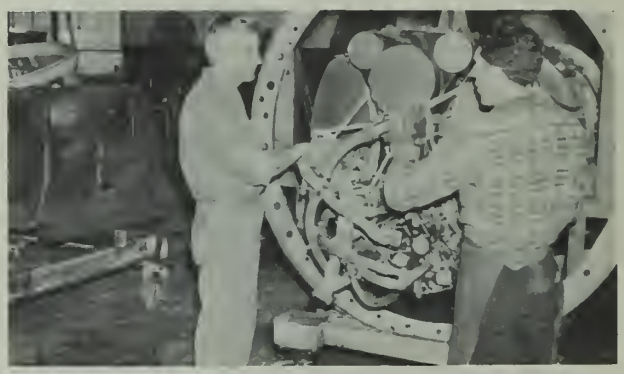
Estimated savings resulting from the entire reclamation project will amount to a net total of approximately $3,000,000 which can be diverted by the Department of Defense to the procurement of other vital materials, and this is occurring at a time when it is particularly essential to reduce costs in all areas.

By Capt. J. C. KEMP, USN

Commanding Officer, Naval Air Rework Facility, Quonset Point, R.I.

Even more important is the fact that this action permitted the continued rework of the J71–A–13 engines which are required in direct support of Southeast Asia operations, and this program could not be completed without the spares made available through reclamation.

From the viewpoint of NARF, this action has created and maintained useful and essential work for approximately 100 artisans on a full-time basis and also a comparable amount of work in the indirect supporting areas. Approximately 340 hours are required for dismantling each J71–A–2 engine and reclaiming the spares amounting to a total of 32,000 direct hours for the 94 engines. The rework of each J71–A–13 engine requires approximately 850 hours for a total of 141,000 direct hours for the 166 engines to be processed.



An obsolete Navy J71–A–2 engine is disassembled to obtain usable parts to support Air Force J71–A–13 engines.

Mr. Anthony Mattiace, an employee of NARF, checks the measurements of a J71–A–2 case assembly. Each reclaimed compressor case saves $2,740 for the Air Force.

In summary, the benefits of this cost reduction action are:

- The Defense effort is maintained.
- $3,000,000 savings for DoD.
- More jobs for NARF personnel. □

From Among Industry Cost Reducers, an Air Force Organization Helps Select—

ONE-IN-A-HUNDRED

RECOGNIZING individual accomplishment is an integral part of any effective effort to motivate people. Motivation is one of the most important elements in the successful operation of the Air Force Contract Management Division's—Cost Reduction Program.

Top management must develop an atmosphere which encourages creativity and improvements—and this is important. But maximum accomplishments will not occur unless the individual employees themselves have a positive attitude toward creativity and improvements. This attitude consists of being alert for areas that might be improved and, when they are found, thinking creatively in an attempt to improve the situation. This type of attitude can be developed or sustained, to a significant degree, through recognition programs.

Contractor Cost Reduction Program

The Air Force Contract Management Division and its 21 Air Force Plant Representatives (AFPROs) administer over 18,000 contracts at 24 industrial plants located nationwide. These contracts have a total face value of approximately $45 billion.

The author congratulates C. W. Aplex after presenting him an AFCMD "One-In-A-Hundred" award. Aplex, a Lockheed Missiles and Space Company inspector, received the award for his design of an improved inspection method for the Agena Space Vehicle.

The Cost Reduction Program is administered at each company plant by a Cost Reduction Program manager through a project management type organization. A specific individual, usually on an additional duty basis, is assigned program responsibility in each functional area throughout the company.

At each of the plants, the designated monitor for the Defense Contractor Cost Reduction Program is either the Commander or Deputy Commander of the AFPRO. Staff assistance is furnished by the Hq AFCMD Cost Reduction Program Monitor.

The successful operation of the program, which is voluntary on the part of contractors, depends to a great extent on effective Air Force-Industry cooperation. This cooperation has led to substantial savings. AFCMD has reported savings of $1.251 billion under the program during the 3-year period ending 30 June 1967. Recognition programs have been a significant factor in this Air Force-Industry Cost Reduction effort.

Air Force Recognition of Contractor Employees

Three years ago, shortly after the program was initiated, the Air Force monitors and company cost reduction managers were contacted in an effort to determine additional things that might be done to encourage effective participation in the program. There was general agreement that from a motivational standpoint, recognition of individual contractor employee contributions was important. In all cases, companies had in-house recognition programs which included monetary or nonmonetary awards or both types. The general opinion was, however, that motivation could be increased if the Air Force established a program in which the Air Force itself recognized outstanding cost reduction accomplishments of individual contractor employees. This, in effect, would be saying to the com-

By Brig. Gen. DANIEL E. RILEY

Commander, Air Force Contract Management Division, U.S. Air Force Systems Command

pany employee "you John Smith have made a significant contribution to the security of the country and Uncle Sam recognizes it and thanks you." It would fall in the category of psychological income and would have special appeal to many contractor employees.

Selection System

As a result of the interest in this type of recognition, AFCMD established the "One-in-a-Hundred Awards Program" in January 1965. The ground rules stated that validated contractor initiated cost reduction items in excess of $1,000 each would be broken into groups of 100 and an AFCMD award would be given to the individual, or group of individuals, who originated the best item of the one hundred. The items would have to meet validation criteria of the DoD Cost Reduction Program. The selection of the award winner (the best of the hundred) would be made by the Company Cost Reduction Manager and the AFPRO Cost Reduction Program Monitor, and would be approved by the AFPRO Commander.

Each "One-in-a-Hundred Award" is presented by the Commander of the Air Force Contract Management Division at an appropriate ceremony at the contractor's plant. The company chief executive officer and several top company executives are in attendance together with the Air Force Plant Representative and other company and Air Force personnel. Pictures are taken of the ceremony and later appear prominently in the company publication with a story which explains the award winning improvement and stresses the overall importance of the Cost Reduction Program. The ceremony, pictures and story are excellent vehicles for selling the program and showing government and industry top management support, which is also vital to the success of the program.

Each year AFCMD presents approximately 20 "One-in-a-Hundred Awards" to individuals in industry. In almost every case, the selection of the best items of the hundred is difficult and the final selection is made from among four or five really outstanding improvements. In order to recognize these other excellent actions, the Air Force Plant Representatives Offices have established an AFPRO Cost Reduction Awards Program, in order to recognize the individuals responsibile for these other outstanding items. The AFPRO Commander presents these awards at the ceremony just before or just after the presentation of the "One-in-a-Hundred Award."

Industry Response

This program has had favorable acceptance by industry. Commenting on the program, Mr. James Abbett, Lockheed-Missile and Space System Co., Cost Reduction Manager said "Experience has taught us at Lockheed the importance of recognizing individual achievements to motivate employees for greater cost reduction realization. The Air Force Awards not only greatly assist us in the area of motivation, but also emphasize to employees the importance customers place on cost reduction." Mr. W. S. Urquhart, North American-Rockwell Corp., Group Director for Cost Reduction and PRIDE programs, stated "The One-in-a-Hundred Awards have proven to be an effective motivator and a most appropriate vehicle for recognition of the efforts of many, many participants in our Cost Reduction Program."

Mr. C. W. Doyle, Cost Reduction/Value Control Administrator, General Dynamics/Ft. Worth Division in a rather comprehensive analysis of the relationship between recognition and successful Cost Reduction Programs stated:

> "I am firmly convinced that the effectiveness of any Value Engineering/Cost Reduction program will be in direct proportion to the personal support given the program by top management. I am equally convinced that the support of top management will in turn be a direct reflection of the customers' attitude and receptiveness. There is no question but that the Air Force Award program has proven to be an invaluable factor in:
>
> "1. Demonstrating the customers concern with and recognition of outstanding effort to enhance value and
>
> "2. Stimulating positive action on the part of industry management to strive for excellence in this important facet of weapons system management."

"1-in-100" a Good Motivator

The purpose of the Defense Contractor Cost Reduction Program is to encourage all contractors to intensify their efforts to realize cost reductions in the performance of Defense contracts. The savings must be accomplished without adversely affecting quality, technical performance or delivery schedules. Effective DoD-Industry cooperation is vital to successful operation of a program such as this.

The conclusions of the Second Annual Air Force-Industry Cost Reduction Workshop and Awards Ceremony which was hosted by AFCMD, included the following:

> "Motivation of employees is the *most* essential element for an effective cost reduction program. This program, like many others, is people oriented. Companies are now motivated through the incentive features in their contracts. They are also motivated by sharing in the recognition of their employees who receive awards at formal presentation ceremonies. This motivation is obtained through the publicity gained from employee recognition."

The AFCMD "One-in-a-hundred Awards Program" has been a significant factor in the successful operation of the Defense Contractor Cost Reduction Program in the 24 plants whose contracts are administered by Air Force Plant Representative Offices of the Air Force Contract Management Division. □

NO PLATE LIKE CHROME

Ernest W. Ulmer, Jr. (right), foreman of the pneudraulic shop, 3525th Field Maintenance Branch, shows SSgt. Robert Barzelogna, deficiency analyst, 3525th Pilot Training Wing, Williams AFB, a worn hydraulic quick-disconnect coupling from the boattail of a Northrop T–38 Talon.

Williams AFB (Ariz.) uses Northrop T–38 jets (TALON) to train fledgling pilots. The hydraulic system of the T–38 has several quick-connect couplings. New couplings (costing $32 each) were being substituted for worn couplings during maintenance check until Ernest W. Ulmer, Jr., put a stop to it.

Ulmer a foreman of the pneudraulic shop in the maintenance branch at the Nation's largest undergraduate training base, found that worn couplings could be milled down and then chrome-plated to original configuration.

Ulmer's superiors located a firm that contracted to repair the couplings at a unit cost of $2.22.

57,511 programed flying hours for T–38's in fiscal year 1968 at Williams AFB will wear out 1,148 coupling changes, according to estimates. The base expects to save $34,187.44 from Ulmer's suggestion. Ulmer received a cash award of $825 for the idea. He may receive more if his idea is adopted throughout the Air Force.

IN TENTS-IVE ACTION

The 6986 Security Group saved $16,717 for the Air Force by using excess tents as tarpaulins.

An urgent requirement for 225 water repellant tarpaulins developed when the group received 78 crates of "pre-cut," unassembled, family houses.

Before initiating procurement, an intensive search for substitutes uncovered 75 excess tents at Tachikawa Air Base, Japan. Lashing the tents over the crates provided the same protection as tarpaulins.

FUEL TANK WELD VE'D

No tigers but there is improved welding in the external fuel tanks of F–101 Voodoo jet aircraft as a result of an Air Force Logistics Command's Ogden Air Materiel Area study that saved the Air Force over $400,000 last fiscal year.

The Air Force ordered 1,140 external 450-gallon fuel tanks and then, after the contract was let, decided that the welding should be upgraded as an additional safety factor.

Without the improved weld, the contract came to $817,219. The contractor said that it would cost $475,-152 to meet the new weld requirements.

Engineers in Ogden AMA's Materiel Management Directorate at Hill AFB, Utah, conducted a value engineering study. They found that the new weld criteria could be modified and still retain additional reliability. As a result, the modification cost $26,915—or less than 6 percent of the price quoted by the contractor.

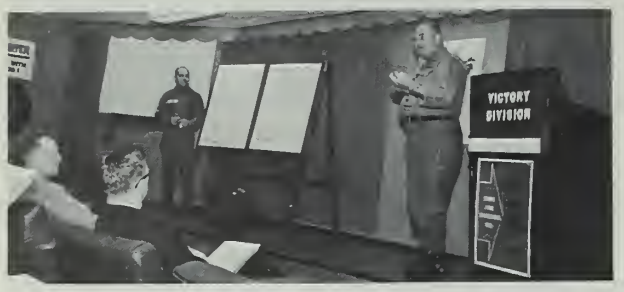
All tanks are being procured to include the modified weld acceptance criteria. The new criteria has reduced procurement costs and will result in large savings to the Air Force.

Total savings by the end of fiscal year 1969 will come to $496,400.

"COLD CUTS"

Harry Taylor, an employee at Defense Depot Tracy, California, uses a band saw (see photo) to slice packing costs. Dubbed "Operation Cold Cut," the procedure saves time and material since Dry Ice, used in packing refrigerated shipments, can be cut to the exact size and weight desired. It does away with the old "trial and error" method of chopping, weighing and packing odd-sized chunks of Dry Ice. Used with new thermal containers, the cut-ice method is expected to result in savings of almost $4,000 during fiscal year 1968 for the DSA installation.

CULTIVATING THE GRASS ROOTS



The 25th Division's cost reduction seminar spokesman, CW3 Arnold M. Glazer explains the correct preparation of the new cost reduction reporting forms, while M/Sgt Jacque Ramer stands by the demonstration models. Shown in the audience (left to right) are Major General R. Wetherill, Commanding General of the "Victory Division," and Ray C. Chase, DA Cost Reduction representative.

"The average enlisted man has always been taught that the Army does everything right in the first place; this must be overcome . . . Get him to look at what he does and see if it can be done cheaper or better." This sage advice was passed on to the members of the 24th Infantry Division, Augsburg, Germany by its commander, Major General R. Wetherill at a recent cost reduction seminar.

Convinced that "a program like cost reduction needs an occasional shot in the arm," General Wetherill set up the seminar so that his staff could "regroup on the objectives of cost reduction." He selected two of the division's outstanding cost reduction "evangelists," CW3 Arnold W. Glazer and MSgt Jacque Ramer of the G–4 section to coordinate the affair and lead the discussions.

Three senior cost reduction representatives from the Pentagon, Raymond C. Chase, Chief, Army Cost Reduction Group; Vincent Falvey, Secondary Items area monitor; and Dan C. Crowley, Army Audit Agency actively participated in the seminar.

The three Headquarters, Department of the Army representatives stressed the need for increased cost concern at the grass roots level, and applauded the aggressive support being given the Cost Reduction Program by the members of the 24th Infantry Division.

In a separate interview taped for local radio audiences Mr. Chase said, "We must keep cost reduction foremost in our minds. Always consider the cost impact of what we do, and try to associate the way we carry out our jobs with the possibility of achieving savings without impairing readiness or combat capability."

NEW TECHNICAL MANUAL PROMOTES REAL PROPERTY MAINTENANCE SAVINGS

A joint tri-service manual for "Paints and Protective Coatings" has been approved for publication for use throughout the Department of Defense. This manual has been in preparation for the past two years by the professional personnel of the Departments of the Army, Navy and Air Force, and supersedes the separate manuals of the Departments. It will be available for purchase by the public from the Government Printing Office.

This manual furnishes information about products, practices, procedures, materials, equipment, methods and safety measures used in the protective coating of buildings, structures and other facilities at Department of Defense installations. Tables of recommended coating systems for a variety of applications are included. The principal causes of failure of protective coatings are identified and specific corrective measures are suggested as well as the proper preparation and repair of the surface.

The standards and methods prescribed are intended as a means of accomplishing the protective coating of real property facilities in the most efficient and economical manner. The procedures outlined have been developed from the best technical sources available in industry and military services.

Substantial cost reduction savings are expected to be achieved throughout the military establishment by the use of this manual. The annual cost for painting and protective coatings approximates $200 million and savings of over 10 percent are anticipated.

AFCMD CONTRACTORS REPORT $411 MILLION SAVINGS TO DoD

Participating industries assigned to the Air Force Contract Management Division (AFCMD) for contract administration reported $411 million savings in the Defense-Industry Contractor Cost Reduction Program for fiscal year 1967, announced Brig. Gen. D. E. Riley, Commander, AFCMD.

General Riley said:

> "Savings generated over the past 3 years by AFCMD participating companies totaled 45 percent of the $2.7 billion savings reported to the DoD by the 85 participating companies. This joint Defense-industry effort to reduce cost has been achieved without sacrifice of quality or reliability."

Up to 50 percent of cost reductions made by contractors in supplying material to the DoD can be shared by the contractors under incentive programs.

Examples of outstanding 1967 fiscal year savings include: $327,800 saved by North American-Rockwell Corporation's Autonetics Division, Anaheim, Calif., by centralizing the shipping functions of its three product divisions; $206,299 saved by Lockheed Aircraft Corporation's Missile & Space Co., Sunnyvale, Calif., by changing its method of paying for digital computers.

"In a continuing emphasis on the Cost Reduction Program, AFCMD was host to a joint Defense-industry workshop during fiscal year 1967," remarked Harvey McKay, AFCMD Cost Reduction Program Monitor, "Cost reduction personnel from both government and industry met face-to-face to discuss mutual programs and interests concerning the Defense Contractor Cost Reduction Program. This has resulted in increased savings and a more complete understanding of mutual problems and objectives by both government and industry."

PROCUREMENT FAIRS

How often do you find something that costs less today than it did a year ago? The Army's Missile Command is not only finding lower prices for missile items, but also earlier-than-expected delivery schedules.

How? By holding fairs.

MICOM's Procurement & Production Directorate started its fairs in October 1966. The fair places current procurement packages on display on a stated day, enabling industry representatives to visit the Arsenal and receive full information about prospective procurement. Arsenal representatives are available to answer industry questions about specifications, packaging, etc.

Seven fairs were held in the fiscal year ending 30 June 1967. Attendance averaged 168 per fair. 138 firms from 17 States were represented in the attendance. A total of 1,400 different solicitations were placed on display at the fiscal year '67 fairs, and a total of 21,000 individual procurement packages were distributed to fair attendees.

All solicitations available at the fairs are also distributed by the usual method of mail solicitation to firms on the MICOM Bidders List. In this way prices obtained from fair participants can be compared with those from the usual sources. When bids were received from both fair participants and from Bidders List an average savings of $850 per contract resulted. The fairs are estimated to have saved $558,000 in fiscal year 1967. In addition, production leadtime averaged 25 days less under "fair" awards than under bids received from normal Bidders List sources.

Three fairs have been held to date this fiscal year: one each in August, September and October. Attendance is improving, averaging 212 representatives from 167 companies in 23 States. 594 individual solicitations have been offered and over 12,000 bid packages have been distributed. Already, 165 awards have been made with 115 going to fair participants. 114 of these awards went to small businesses. Fair awards in fiscal year '68 are saving an average $672 per contract compared with normal solicitations and promised deliveries are 20 days faster.

USAMICOM is only one of several installations in the U.S. Army Materiel Command conducting procurement fairs.

MOBILE AID STATION

Moving the medic to the mishap instead of the usual vice versa reduces travel time 40 minutes per minor non-disabling injury received by waterfront personnel at the Naval Weapons Station, Concord, Calif.

The physical location of the Medical Aid Station in relation to the ship loading and berthing areas is such that it took patients 40 minutes round trip via Station Taxi Service to visit the aid station with 10 minutes for actual treatment.

In order to reduce the time lost, a station ambulance (see photo below) was outfitted with necessary equipment and supplies for treatment of minor injuries. No additional personnel were required, and this "mobile" treatment unit is now dispatched to the actual job site when notified by radio that an employee has been injured. The patient, therefore, loses no time in transit to and from the aid station.

LACKS RACK, ACQUIRES KNACK, GAINS STACK

A do-it-yourself project produced over one thousand spare-tire racks for commercial design truck tractors at a cost of $14.43 per rack ($101.22 below the tractor manufacturer's price of $115.65) for savings of $105,-268.

The 28th Transportation Battalion fabricated the racks for the 37th Transportation Group in Kaiserslautern, Germany. Karl Hoenit of the Group's civilian labor force originated the idea.

PNEUMATIC TIRE BUILD-UP- AUTOMATED

The first recapped tire was produced at the U.S. Army Maintenance Plant, Ober-Ramstadt, Germany, on 16 May 1946 after two Ordnance Tire Repair Companies had moved from France and Belgium to their new location in Germany and been consolidated at Ober-Ramstadt in January and February 1946. Since that date the plant has been in continuous operation and has rebuilt in excess of two million tires.

The maintenance plant is an activity operated by the U.S. Army Communications Zone, Europe, in its role of supporting the European Theater. In addition to the mission of rebuilding tires, this facility produces all types of rubber articles for automotive and combat vehicle equipment. Other items of rebuild include track pads, road wheels, support rollers for tracked vehicles, and numerous smaller rubber items.

The plant sells all of its products and services at cost price to the U.S. Army customers. The difference between rebuild cost and acquisition cost of new items aggregated an impressive $6,187,177 in fiscal year 1967. A primary responsibility of the plant is to stay abreast of industry improvements in tire rebuild and other rubber work.

Through 20 years and 2 million tires, the plant made little change in its tire rebuild processes. Basically, the procedure involved removing the old tread, applying new, unvulcanized rubber, and then vulcanizing a new tread on the old carcass. This conventional method is still generally followed by recappers all over the world today. The rubber applied in the conventional method is called camelback, is unvulcanized, and is procured in various die sizes. Each die size corresponds to a given size tire, type of mold, and tread design. As the Army's equipment became more modern and more varied, so did the tires. To keep up with this change and to provide continuous support, more and different sizes of camelback had to be procured and stored. As a result, more funds and warehouse space were required to insure that the right type of rubber was available when it was needed. Also, the manual application of rubber by the camelback method was time consuming and required a considerable amount of skill on the part of the tire builder.

Then came the day when the plant heard of a breakthrough in tire rebuilding—an electronic tread maker that transforms tire building into an automated precision production process. Although the old tread must be removed and the new tread vulcanized, the machine eliminates the need to procure and store various sizes of camelback and shortens the time it takes to rebuild each tire.

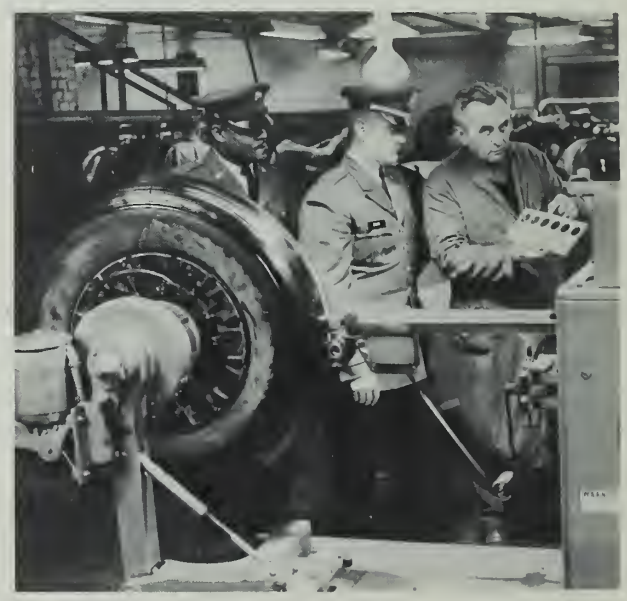
This new system uses only one type of rubber for numerous sizes of tires. It extrudes a ribbon of rubber 1 inch wide and one-tenth inch thick and heats it to a temperature of 240° F. The hot ribbon is then wound around the circumference of a buffed and cemented tire casing until the desired contour has been reached. The entire process is automatic and unattended because electronic controls guide the operation by a prepunched program card. A different program card is used for each tire size and completely controls the winding pattern, tread depth and width until the correct amount of rubber is precisely positioned on the casing. When tread application has been completed, the machine turns off automatically and a perfectly built-up tire casing is ready for curing in the mold.

Initially 2 of these machines were installed in September 1966 on a trial basis. They performed so satisfactorily that 2 more were installed in April 1967, giving the plant enough capability to handle up to 120,000 tires a year.

The machines have greatly simplified the inventory and training problems because only 1 type strip stock is used instead of over 10 different die sizes of more expensive camelback. Net savings in material and labor cost for fiscal year 1967 amounted to $75,000 and will jump to $250,000 in fiscal year 1968 when full use will be made of 4 machines through the entire year with initial installation costs having all been charged against the fiscal year 1967 operation.

Additional benefits will be realized in procurement and warehouse space which have not been included in the above savings.

The photo shows the machine in operation at the U.S. Army Maintenance Plant, Ober-Ramstadt as it applies rubber on an 11.00 x 20 size truck tire. Shop Superintendent Hahn is shown explaining a program card to 1st Lt. Peter J. Dixon, the Deputy Commander of the Plant.



SAVINGS RECAP

Two aircraft tire retreading programs initiated by Air Force Logistics Command's Ogden Air Materiel Area (Hill AFB, Utah) will save the Air Force $1,755,700 this fiscal year.

Maj. Gen. T. Alan Bennett, OOAMA Commander, identified the tires as those used on the eight-jet B–52 bomber and the four-engine C–141 jet transport. Prior to a special retread study made by the Landing Gear and Trainer Equipment Division and the Service Engineering Division, the tires used on the two types of aircraft were discarded when the tread became worn away.

Based on the study results and assistance obtained from two tire companies, specifications were developed for a retreading process for the two types of tires. A B–52 tire (size 56 x 16), costing $281 new, can now be recapped once for an average cost of $102. The C–141 tire (size (44 x 16) costing $182, can be recapped at a cost of $67 each time. Additional studies are underway to determine if the number of recaps per carcass can be increased. The retreading operation is performed by various tire companies under competitive contract arrangements.

IDEA EXCHANGE

The Army Materiel Command has established a formal system for interchanging workable savings ideas among its components. Determined to gain the greatest possible mileage from valid cost reduction actions implemented within the Command, the AMC Cost Reduction Program Manager, Mr. I. Berg, announced the following procedures to go into effect immediately:

a. Actions to be distributed will be drawn from fiscal year 1967–68 experience and will be chosen with a view to their applicability to other AMC commands or activities.

b. Each command and depot will select not less than 10 actions and forward them to counterpart commands and depots.

c. Each procurement activity, laboratory, and project manager will select not less than two actions and forward them to counterpart activities.

d. Cost reduction offices will specify areas in which they desire special coverage and recipients of such requests are expected to make every effort to supply helpful information.

Target date for the initial exchange was March 1, 1968 with additional exchanges to be made April 12 and August 1. The results will be evaluated by a special study group to be convened as a part of AMC's workshop conference planned for September 1968.

PALLETABLE STUDY

"The new pallets cost twice as much but last seven times longer" announced Col. Frederick E. Price, division chief at the Warner Robins Air Materiel Area. He could have added that these new pallets for air cargoes will save the Air Force nearly $4 million by July 1, 1969.

The new pallets were designed to replace the standard "sandwich" pallet constructed of heavy aluminum skin with a balsa wood core. The old pallets did not stand up under the stress and strain of supplying Vietnam by air. Loaded down with up to 10,000 pounds each of such items as Army's howitzer barrels, aircraft carrier propellers, tank tracks, and tons and tons of ammunition, the wood cores became unglued from the metal surfaces, the edges split away and the surfaces warped and bent.

WRAMA's value engineering chief, William Elliott selected a study team made up of Ted Smith and Bill Richardson, engineers, and Malcolm Rogers, a mechanical engineering technician to dig into the way a pallet is built, and how it is used; and then to design a tougher, stronger pallet. Members of the team went to Vietnam and other spots around the world to gather data needed for their studies and to see at first-hand the pallets getting dumped, soaked, forklifted and dropped during unloading and loading operations. The team returned and constructed a new pallet with a tougher aluminum bottom skin, an improved epoxy-resin adhesive, better gluing and bonding procedures and stronger corners and side rails. When tested, the new design lasted seven times longer than the old pallets.

Pleased with the success of the tests, new pallets were procured and put in use in Vietnam where their extra strength and stability permit the rapid and safe unloading of essential military cargo.

Malcolm Rogers (left) and Ted Smith, engineers at Robins AFB, Ga., checks out the new cargo pallet designed by members of their value engineering team. Each new pallet will outlast seven of the old type and save the Air Force $4 million by July 1, 1969.

NAVY'S SINGLE SUPPLY CONTROL POINT

A Forward Look at Lower Cost Overhaul/Repair/Rework

The Outlook

Commercial rework of Navy aircraft will cost substantially less in fiscal year 1969 than it does now. A brand new Navy concept in supply support, presently being tested in a prototype program, will turn the trick. This new management approach increases the availability of Government furnished material in Navy inventories and cuts down on the frequency that Navy contractors are required to resort to the open market. It is anticipated that the new concept will:

- Reduce the number of contract administrative and funding elements.
- Reduce material delivery time.
- Reduce production delays and work stoppages.
- Reduce the processes for satisfying contractor material requirements.
- Reduce overall contract material cost by 28 percent or more.
- Eliminate unnecessary material fabrication and purchases.
- Eliminate technical material problems.
- Provide actual usage data for preplanning and system stock adjustments and replenishments.

The Conventional Way

The Navy provides funds to contractors to buy Government furnished material when it is not available within the Navy Supply System. Experience has shown that this nonavailability occurs all too frequently with contractors actually buying 55 percent of their material requirements. Each such purchase consumes considerable administrative time since specific authorization for open market purchase must be obtained from the Navy. The authorization process not only is time consuming and costly, but also jeopardizes production schedules. Moreover, the Government realizes only a portion of its investment when material is purchased by a contractor; the contractor's G&A, profit, handling fees, etc., eat up the remainder.

The problem is a substantial one. In fiscal yea. 1966, approximately $5 million was expended by contractors [under 26 programs] to purchase nonavailable Government furnished material for overhaul, rework or maintenance of aircraft and engines.

Technical problems also occur whenever contractors purchase similar or equivalent items that are not programed into the engineering data files for the aircraft or engine involved. This factor has created mixed configurations, resulting in problems to the Fleet when replacement in the field is required. Also, maintenance problems can be expected since adequate technical data is not available in most of these cases.

Reasons for Nonavailability

Unavailability of Government furnished materials to the contractor does not mean that Navy lacks the material. The Navy may have it and the appropriate Naval Supply Unit may know this, but some requisitioner other than the contractor might have a higher priority to receive it. Or, the Navy may have it but the accounting system may not be sufficiently responsive to inform the appropriate Naval Supply Unit of the material's availability.

The new concept addresses itself to the latter condition by providing a faster, more accurate servicing of requirements.

The New System

The heart of the new system is the Single Supply Control Point, one for each repair/rework program.

Formerly, a contractor seeking a particular item of Government furnished material would have to contact the Aviation Supply Office and the Naval Plant Representative Branch Office *in every instance*, and sometimes the Naval Plant Representative Office, the Naval Air Systems Command Representative and Naval Air Systems Comand as well. Some of these organizations process requisitions for Government furnished material from *all* ongoing repair/rework programs. Hence, every requisition handled by them receives the same impersonal treatment, there being no attachment in these offices to any one of the programs in particular.

Under the new concept, the contractor has to touch base at only one spot, the Single Supply Control Point.

What does it take to move a management system from bare concept to working prototype? Answer—Two interested people in the case of the Single Supply Control Point:

- An idea man with initiative enough to blueprint his design.
- A responsive supervisor with spirit enough to route the blueprint to "where the action is."

The idea man was A. Gianotti (left), an industrial specialist in the Naval Air Systems Command Headquarters, Washington, D.C.

The supervisor was Lt.Cmdr. B. L. McClellan (right) then head of the Commercial Rework Branch at the same headquarters and now with the Naval Air Rework Facility, NAS Jacksonville, Fla.

The entire energies of the cognizant personnel of that organization are devoted to the successful operation of the repair/rework program. Also, the people who staff the organization are specialists in the Supply system operation as well as technically familiar with the specific program.

The Single Supply Control Point:

- Manages the contractor's requirements through the Supply system.
- Screens excess listings and seeks out exchange opportunities with other services.
- Assures that no approval substitute or equivalent item is available prior to initiating purchase.
- Purchases material to meet a production situation (instead of having the contractor do the purchasing).

The value realized by the Navy during a fiscal year 1967 pilot contract under the conventional procedure, is compared with the value realizable under the new concept in the following table:

	Conventional procedure	New concept
Funds provided	$600,000	$600,000
Less G&A and profit	234,000	30,000
Funds available for purchase	366,000	570,000

Other Advantages

The concept improves preplanning for future programs going to commercial facilities by:

- Standardizing procedures.
- Assuring coordination of material requirements via mechanized Milstrip/Milstrap procedures rather than the present manual processes.
- Simplifying liaison with the contractor.
- Consolidating records and reports.
- Providing opportunity to combine several small purchase requirements into a single large one so as to obtain a better price.

Conclusion

The new concept was implemented May 16, 1967, as a prototype program. Evaluation of improvements achieved after 9½ months indicates the Single Supply Control Point concept is effective. Savings and cost control have been evident throughout the prototype phase. Out-of-house purchases have been almost eliminated, due to proper screening of the system including Air Force assets. Consolidation of effort through the Single Supply Control Point has resulted in a program readiness situation sufficient to support the next fiscal year schedule.

Of course, the proof of the pudding for any new management technique is the result. In this respect, supply support under the pilot program satisfied 98 percent of the contractor's requirements, production delays were zero to 2 percent, and no work stoppages were indicated to delay delivery of aircraft prior to their scheduled delivery date.

The concept's full potential, however, cannot be realized until the Single Supply Control Point system is fully implemented and properly managed on a Navy-wide basis. Once this occurs, timely material support at reduced cost for commercial overhaul/repair/rework programs will be assured. □

GRINDS PADDING UNDERFOOT

A leather heel pad worth 2½ cents isn't much in itself, but over four million of them represent quite a tidy sum.

Alton B. Locklair, Jr., a government Quality Assurance Representative in Charlotte, N.C., reasoned that the pads were unnecessary in the latest model boots made for the military services.

The new version of the combat boot features a one-piece molded rubber sole and heel. Locklair's suggestion that the pads be eliminated resulted in a change of specifications at no sacrifice of serviceability or appearance.

Based on production of 2,177,991 pairs of boots forecast this year in the 7-State Atlanta Defense Contract Administration Services Region, Locklair's idea will save taxpayers $108,899.

For his contribution, Mr. Locklair recently received $1,165, the largest suggestion award ever presented in DCASR, Atlanta.

A native of Charleston, S.C., Locklair has spent 16 years in quality assurance with the Department of Defense specializing in clothing, textiles and leather goods. He is assigned to the Charlotte Field Branch Office.

IT'S IN THE BAG

Savings are in-the-bag at Defense Depot Tracy, California, when it comes to preparing subsistence shipments for outside storage. Swing-shift employees Nick Waterman and William Sanders flip shroud of plastic tubing over a pallet of subsistence supplies scheduled for outside storage while awaiting shipment. Use of the polyethylene material instead of the heavier, bulkier tarpaulins formerly used, is expected to result in annual savings of more than $14,000 at the DSA depot. The shrouds are slipped over a pallet in less than a minute and, unlike the tarpaulins which had to be removed, remain as additional protection for the cargo during shipment.

METAL SPRAY PLATES PARTS

At the Naval Air Rework Facility, North Island, aircraft engine components with damaged and out-of-tolerance bearing surfaces were repaired by a process of immersion electrolytic plating (chrome plating). Labor, requiring 3.5 man-hours per unit, involved masking, immersing, (see "before" photo below) removal of the parts from the plating tank, and demasking. Not only did this overload local plating facilities, but a great deal of rework was produced due to failure of masking gear.

Management experiments with plating using molybdenum metal, a spray bond, produced highly successful results. As a result, the high intensity metal spray process is now a standard repair for oversized and worn bearing liners inside the generator, starter, and motor housings. The new process (see "after" photo below) has reduced the manhours formerly spent in tank immersion plating—and NARF, North Island, reported $233,730 in annual savings to the Navy.

BEFORE

AFTER

AMMO STORAGE COSTS CUT

Ammunition storage sites go "boom" with commendable infrequency. Just once, however, is too many. For that reason, numerous safeguards surround ammo storage. One safegard is the buffer zone separating storage site from civilization.

Recently, interservice cooperation helped the Army safely rid itself of a costly buffer zone.

The Army maintains a major ammunition storage site at the Aliamanu Military Reservation in Hawaii. Since 1955, the Army had been leasing from a commercial firm 137 acres of land along the perimeter of one portion of the reservation land that constituted a buffer zone for the storage of special ammunition.

The lease agreement was for $6,000 a year. In May 1966, the lease cost was increased to $33,078. Subsequently, discussions were begun concerning the possibility of the Navy storing all components of special ammunition allocated to the Army. The Navy policy up to this time permitted the Navy to store only certain components of special ammunition for the Army. The Chief of Naval Operations approved a change in policy to permit the Army to store within Navy facilities in Hawaii all components of special ammunition allocated to the Army.

This interservice support agreement permitted the Army to cancel its lease effective June 1967. The storage of all components of special weapons in one storage area has also contributed to better operations.

Offsetting costs of $5,621 (incurred in the movement of the special ammunition from Army to Navy facilities) were deducted from the lease cost of $33,078 to arrive at a net savings of $27,457.

VERT MAKES VE CONVERTS

A review and study system introduced at Naval Air Systems Command Plant Representative Offices places new emphasis on Navy-contractor cooperation in value engineering.

The prime element in the new system is the Value Engineering Review Team (VERT). A VERT consists of four to seven persons, each representing a different organization in the NAVPLANTREPO (e.g. production, engineering, procurement and value engineering). The VERT's purpose is to develop ideas and to elicit VE changes from NAVPLANTREPO personnel. The VERT then recommends these ideas to the Navy contractor as a possible basis for a VECP (Value Engineering Change Proposal). This VE technique has proven to be a very successful method of performing a VE study and provides good potential for increasing the submission of VECP's by Navy contractors.

At present, 10 VERT's are operating in Naval Air Systems Command Plant Representative Offices. The use of VERT is a good indication to Navy contractors that the Navy is behind the Value Engineering Program.

Dave Fram (right) Sperry-Rand Cost Reduction and Value Engineering administrator recently conducted a three-hour workshop held to indoctrinate Naval Plant Representative Office personnel in the VERT concept. John Ferme (center), NAVPLANTREPO VE and Chairman of VERT assisted in its planning and coordination. Captain F. Colenda (left) Naval Plant Representative, Sperry Gyroscope and Sperry Systems Management Divisions, Great Neck, New York, kicked-off the meetings with a statement highlighting the need for aggressive attitudes for effective government-contractor cooperation.

MEMORABLE MEMORY EXCHANGE

When DCA contracted to "beef up" a computer in DCA's Operations Center in Arlington, Benjamin A. Gurtoski, a DCA computer specialist from Suitland, Md., obtained contractor data that reduced the contract cost estimate by $8,000. Gurtoski also suggested the exchange of memory controllers between the Defense Commercial Communications Office (DECCO) and DCA and the elimination of contemplated modifications to a surplus DCA memory core. The latter suggestion saved an estimated $34,000.

DECCO, a DCA field activity at Scott Air Force Base, Ill., is responsible for leasing and fund management for all Department of Defense commercial communications orginating in continental United States. It has a field office in Honolulu for leasing services in Hawaii.

Gurtoski received a $250 award.

TEAMWORK TRIUMPH

Painters working on third-floor scaffolds should not step back to appraise their work. However, this step-back technique can have positive results in most other instances—as SFC Reny A Bois found out.

Bois is with the Furniture Repair Shop, U.S. Army Depot Command, Japan. He chose four Japanese nationals from among the shop's employees to find ways to improve operations. This team came up with better methods, new tools, and a conveyor belt system.

U.S. Army Headquarters Japan reports that Depot Command personnel are enthusiastic supporters of the Cost Reduction Program—evidenced by $784,000 in valadated savings during fiscal year 1967.

Shown from left to right are the members of SFC Reny A. Bois' shop improvement project team: Mr. Bungo Ushioda, Mr. Hideo Hiroyama, (SFC Bois), Mr. Takaji Hirai, and Mr. Yoshikuni Kumagayo. Their ideas for improved methods and equipment saved $784,000 for the Army Depot Command's (Japan) Furniture Repair Shop.

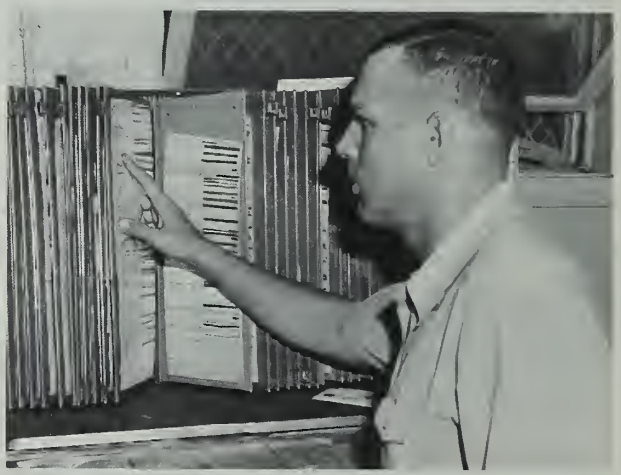
SLOWS DOWN BRAKE WEAR

Modifications developed by the Ogden Air Materiel Area's Materiel Management Directorate have extended the average life of landing gear brakes on the B–58 "Hustler" bomber from about 30 landings-per-brake to over 100.

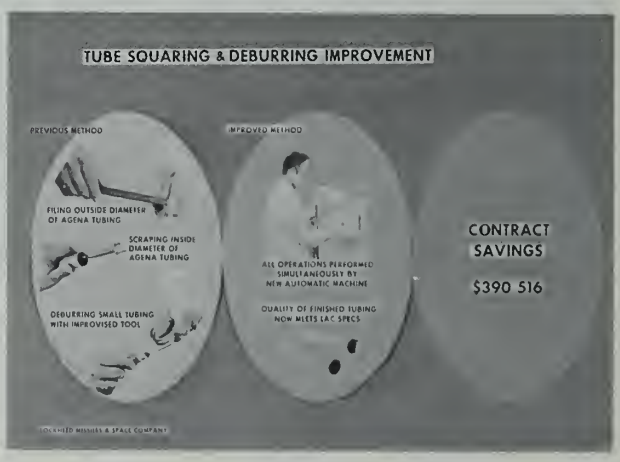
Concern with the extremely high wear-out rate on the brakes prompted a value engineering study. The engineers found that by riveting metal "wear pads" on the stationary discs, pressure plates and backup plate, the easily replaced pads could absorb most of the wear.

The modified system not only extends service life but also decreases downtime of the B–58's and provides a safer braking system. Savings of $288,100 have been realized thus far, and a total of $1,091,600 is anticipated from the improvement.

BASE LOCATOR COSTS CUT



A special 3-man shift of airmen manned the base locator service at Robins AFB, Georgia, 24 hours a day, seven days a week until 1st Lt. Wendell R. Wardell suggested that the regular Charge of Quarters (CQ) and CQ runner assigned to the orderly room during off-duty hours take over the locator job during all non-duty hours of the week. Adoption of this suggestion will save the Air Force $37,800 in manpower over a 3-year period.



A Glimpse of the 21st Century

ADVANCED AIR FORCE LOGISTICS SYSTEMS

Ret. Gen. Ira Eaker, one of the outstanding airmen of this generation, recently returned from Southeast Asia where he visited as a journalist.

Appearing as a longtime consultant and adviser to the Air Force Logistics Command, he told the Command staff at a conference:

"You have the most satisfied customers that I have ever seen. I'd advise you that whatever you are doing to keep it up."

This statement of approbation about modern Air Force logistics, coming as it does from a highly experienced observer, does not mean however that the Air Force Logistics Command intends to rest on its laurels. There are still many things to do, and the Command is doing them. AFLC is going swifty into what can be called the Twenty-First Century of Logistics.

In this fast-moving world with its rapidly expanding technology in the fields of science and engineering, as well as management, AFLC is taking advantage of both the new and improved capabilities available in the science of logistics.

With this in mind, AFLC is taking far-reaching actions that will see to the development, within the early 1970's, of a 21st century logistics system that will make today's system look like the horse and buggy days.

The Look-Ahead Organization

To this end, in October 1967, AFLC established a new operating agency at its headquarters—the Advanced Logistics Systems Center. This Center has the job of developing the 21st century system. Its mission is to serve as the AFLC central agency for planning, designing, programming, testing, and maintaining the AFLC logistics systems and related information systems.

A substantial improvement in AFLC's preformance of its mission—which is to support some 300 weapons systems throughout the world—is expected to result from the Center's work. To understand the urgent requirement for such an improvement, some background information is necessary.

The Logistics Command has had 15 years of experience with computers and is one of the world's largest users of electronic data processing equipment. Currently it is using more than 120 computers. But this is "second generation" equipment, relatively slow, with little random access storage, and sequentially operated in batch processing mode.

The majority of AFLC support systems—using this equipment—have been developed independently for the specific logistics functions, including supply, maintenance, procurement, transportation, and accounting.

DIGESTED. **Logistics Data** *STACKED.*

As a matter of fact, AFLC is now using 376 different and relatively independent logistics management systems. Since almost each one must be related to and support other automated systems in a prescribed manner, a change in one element must be incorporated in the related systems.

This is not to suggest that the systems have not done their job. They have, in fact, performed very well and have enabled AFLC to support worldwide Air Force units without depots overseas. Computers have made it possible for AFLC to decrease inventories and attain greater responsiveness, notwithstanding an increase in the number of types of aircraft and missiles.

Progress Keyed to Computer Technology

However, in today's sophisticated environment, these systems are becoming increasingly difficult to sustain. Magnetic tapes must be processed through the computers regularly—for instance, when matching demands of the day against assets available and directing shipping actions. Computer capabilities are being saturated by the many automated systems and the repetitive machine runs.

Advances in computer technology and in management techniques now make it possible for AFLC to upgrade its current methods to a completely closed loop logistics system to manage its entire inventory. "Third generation" equipment with immediate access storage and real time processing now offers the capability of maintaining unified logistics data. Air Force operating units throughout the world, as well as AFLC functional managers will be able to find the information they need immediately accessible and make their decisions from a single library of data. In other words, the current state-of-the-art will make it possible to get rid of whatever redundancy there is in the present systems and give overall visibility of worldwide assets. This will give logistics the ability to respond more promptly and accurately to problems as they arise.

Goal is Closed Loop System

When completely manned, the Center will have 1,450 people assigned to it. This will include logisticians, computer programers, systems analysts, communications experts, software specialists, and simulation experts. Of these roughly 1,000 have already been reassigned from positions within AFLC headquarters.

Major improvements in the logistics system must come through policy changes in management, major redesign of current systems, and application of advanced information science technology. Information must be more timely, easily accessible to the manager, and correlated across the total logistics spectrum in order to provide more effective management.

The ultimate objective of the Advanced Logistics Systems Center is to bring quicker response to the ever-changing needs of the highly mobile, space-age Air Force envisioned for the near future. A major goal is to provide a closed loop system in which all logistics processes are fully integrated—from acquisition through disposal. This will bring about timely and concerted interaction among all the individual processes and provide feedback of information of material management actions to all parts of the system.

Agenda for Success

The Center will attain its objectives through the parallel time-phased implementation of three items:

- By defining its objectives, the logistics policies necessary to achieve them, and the specific requirements and characteristics of the systems.
- By applying the latest computer and communications technology and management science techniques.
- By increased emphasis on applied research and development, test and simulation of logistics policy, information handling technology, and cost-effectiveness evaluation of both systems and data processing procedures.

The advanced systems will be designed around a large block of random access storage called the unified data file. Complete data on every item in the vast AFLC inventory will be contained here, covering current procurement, supply, maintenance, transportation, and financial data. Headquarters AFLC, its five air materiel areas, and certain other selected bases will have access to this file by means of large-scale, multiprocessing third generation computers. Remote locations will be tied in by responsive communications lines. Equipment will be modular to permit expansion of central processing units, peripheral equipment, or storage units as the need arises.

The Ultimate Product

These facilities will provide continuous up-to-date central knowledge of worldwide stock levels and asset deployment for selected items. This knowledge, for the first time, will allow central management control to equalize and give fullest support to the Air Force within available resources. Such control will centralize computation of base stock levels, computation and projection of procurement and repair requirements, and redistribution of assets for selected items.

When fully implemented, the advanced systems will result in reduced pipeline times, depot repair cycles, and base and depot stock levels. Other results will be improved buy decisions, better distribution of assets, and better overall management visibility. In short, the systems will dramatically improve logistics support to the Air Force on a cost-effective basis. □

TRACK STAR

Ernest R. Walls receives an official commendation, a letter of appreciation, and a $790 check from Colonel James P. Luckey, Chief of Field Maintenance at Fort Knox, Ky., for suggesting construction of an oval eight-tenths mile track on which to test-drive repaired tanks. The new track saves post roads from serious damage and removes a safety hazard to marching troops.

"ROC" AWARD

Pictured above is the "ROC" award pin which is a portion of the extensive promotion and publicity campaign conducted by the Naval Air Rework Facility, North Island. "ROC," which stands for "Project Reduce Operating Costs," is one facet of their Cost Reduction effort applicable to the direct labor area.

The award pin was designed to be presented to those employees at NARF, North Island who submit savings during a fiscal year which amount to or exceed $100,000. In the 2 full years of operation under Project "ROC," 10 employees have earned the right to wear the coveted award insignia.

STAR TREK

The rotating star is a component of the main rotor head of the H–34 helicopter. Its function is to control blade pitch of the main rotor blades. This part has an operating life of 2,500 hours.

In the process of overhauling this item at the Naval Air Rework Facility, Pensacola, Fla., several shops are required to perform different operations. To control identification of the part while in overhaul, a burr tag (aluminum tag) is clipped to each unit with relation to the sequence from which it is removed.

While moving the star from shop to shop, the burr tag frequently is lost—often up to 20 percent are detached. The operating life of the item, therefore, could not be determined to date: and for those unidentified units, service life was estimated at 50 percent depleted.

Mr. Houston A. Matroni of the Transmission Rework II Shop (see photo) recognized the problem and proposed that a serial number be assigned to each rotating star. In addition, he suggested that the serial number be annotated on the accessory service record card of the main rotor head.

The serial number is now applied to the rotating star using the vibrospeen identification method. The process involves a simple hand tool, similar to a wood burning tool, which is used to etch the serial number into the metal of the star.

Now, in the event the burr tag should be detached from a rotating star which is in for overhaul, the remaining service life of the unit can be easily determined by referring to the service record card without estimation.

For his suggestion, Mr. Matroni received a $25 cash award and NARF, Pensacola reported fiscal year 1968 savings of $7,000 and a 3-year accomplishment of $25,000.

Mr. Houston A. Matroni, Naval Air Rework Facility, Pensacola, Fla., examines a rotating star to check the serial number.

DESC INITIATES "EMPLOYEE OF MONTH" SYSTEM

Byron Thompson of 174 South Dorset Road, Troy (center in photo), and Michael Marko of 4025 Prescott Avenue, Dayton, have earned the distinction of being named the first Cost Reduction Employees of the Month by the Defense Electronics Supply Center in Dayton, Ohio. Air Force Brig. Gen. Glen J. McClernon, DESC commander, presented the awards.

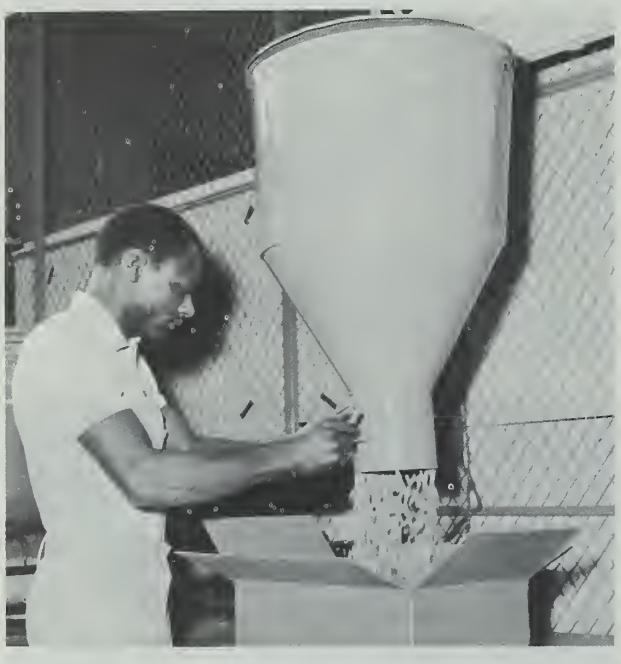
The two developed a second source of supply on an item which is expected to save nearly a half-million dollars over a 3-year period.

The part, a varactor diode, had been purchased sole source because of inadequate procurement information. In recent months, however, demands had risen to the point where the manufacturer could no longer supply sufficient stock.

Thompson, a DESC electronics technician, came to the rescue by developing a data package. Contract negotiator Marko then used the information to advertise the procurement. The method yielded two additional suppliers with one bidding $201.20 per unit, some 66 percent below the sole source price of $585.

Although the effort has generated a first-year savings of $172,610, Center officials have projected that efforts by Thompson and Marko in breaking sole source will ultimately save $467,984 over a 3-year period.

HOPPER SCOTCHES WASTE



A commercial packing material that was previously discarded in the unpacking process is now being retrieved and reused at the Naval Weapons Station, Concord, Calif.

The lightweight packing substance, composed of tiny tubelike particles coated with a wax compound to prevent settling, pads sensitive guided missile parts.

Coy Brooks of the Station's Supply Department designed a hopper (see photo) to reclaim, hold and reuse the packing. The hopper, which would have cost $225 commercially, was made on-base from scrap for $15.40—including labor.

The hopper with its convenient pouring spout saves 6 minutes per carton packaged—or an average of 1½ hours per day. Fiscal year 1968 savings are in excess of $3,000. Brooks was awarded $70 for his suggestion.

CANTILEVER RACKS FOR SHEET METAL STORAGE

An estimated $1,075 a year is being saved by DSA's Defense Depot Mechanicsburg, Pa., following installation of cantilever racks for storage of sheet metal.

Previously, sheet stock was placed on pallets upon receipt and stored wherever there was room, due largely to the rapid rate of receipt of such material. As a result, as many as 10 different line items were stored in the same stack. This necessitated picking up and setting aside many loaded pallets to get at the particular items desired for shipment.

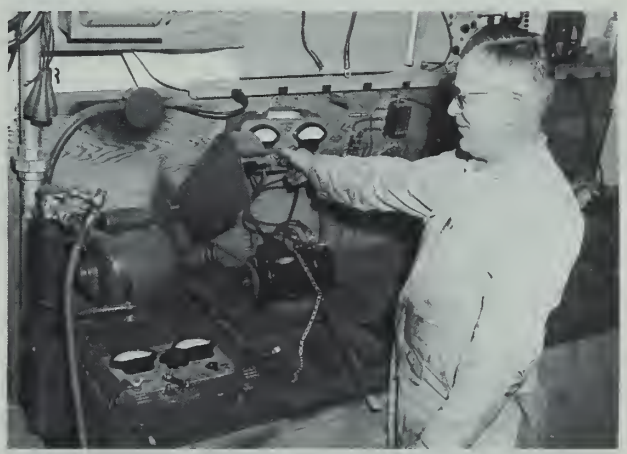
Sheet metal now is stored in cantilever racks which keep the material separated rather than stacked pallet on pallet. This also protect the material since the rack arms extend beyond the width of the sheets. The material is stored in the racks according to frequency of issue.

ACHIEVER

Colonel Coleman O. Williams, Jr. (left), 315th Air Division vice commander, Tachikawa Air Base, Japan, presents an Air Force Cost Reduction Program Achievement Certificate to Captain Jerry F. Whitley. The award is for Whitley's idea for reducing damage to cargo and personnel parachutes used at the nearby Mito Drop Zone by clearing away unnecessary obstructions, trees, etc. The suggestion will save the Air Force an estimated $96,798 through FY 1969.

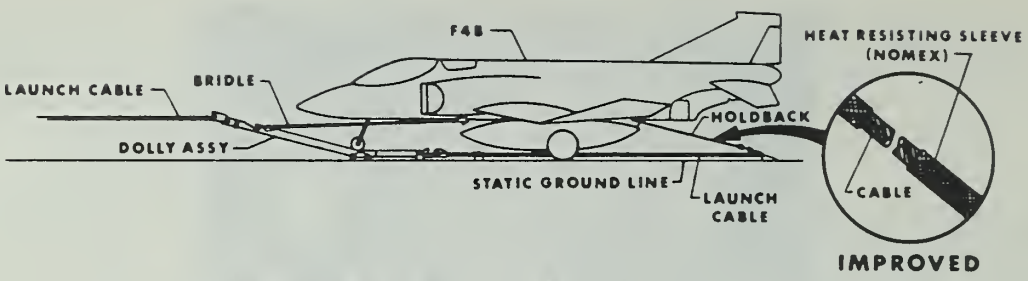
SET OF TESTS SETS

Devising a $45 amplifier test set that masquerades as a $2,200 radio set for the purpose of testing communications equipment earned a $405 cash award for Richard E. Patterson of the Army's Armor Center, Fort Knox, Ky. At left in the photo, Patterson demonstrates for Colonel James P. Luckey, Director of Field Maintenance at the Center, how the test set is used for checking radio headsets and other communications components.



Elmo Costephens, a mechanic in Defense Depot Tracy's Operating Equipment Maintenance Branch, operates a combined generator-starter test set constructed from spare parts. The set provides a means for testing generators and starters in the shop before installation on the equipment. The device, used four or five times daily, is expected to save approximately $1,300 and 720 man-hours annually.

MORE STABLE CABLE



BRIDLE AND HOLDBACK INSTALLATION

Picture, if you will, the mighty F–4 "Phantom" poised on its catapult. Jets are screaming at full power, the plane shudders from the counter effects of the holding mechanism that restrains it until that precise second the catapult hurls it skyward.

Everything must go like clock-work for the plane to become airborne. Every component must do its job perfectly: The catapult must produce the proper "kick"; the plane's jets must shoot out the right amount of thrust; and the holdback assembly must be strong and tough enough to restrain the "Phantom" until the "go" signal.

These restraining devices take a beating from both the high temperatures and the jet velocities generated by the F–4's engines. Consequently, cables require replacement after only two launches.

The short life of the cables has been such a headache that the Navy initiated an intensive program of engineering study last year to develop improvements. The studies resulted in design changes incorporating a new heat resisting sleeve, identified as "nomex." This sleeve protects the cable from the weakening effect of the jet blasts and the new design has increased its life span from 2 to 12 launches.

This value engineering change, initiated and implemented by the Aircraft Weapons and Ship Division of the Naval Air Engineering Center, Philadelphia, Pa., saved the Navy over $330,000 in fiscal year 1967 on 960 assemblies. Savings on 260 assemblies scheduled for manufacture in fiscal year 1968 will add an additional $89,000 to the total savings.

The sketch above illustrates the function of the holdback assembly, and shows the improved cable with the heat resisting sleeve.

TRANSFORMER SPEC X-RAYED

Some sharp-eyed experts at DSA's Defense Personnel Support Center, Philadelphia, Pa., saw right through a recent buy of X-ray transformers and saved $149,856.

The transformers are used as a source of high-voltage current for X-ray apparatus which the Center provides to the Armed Forces. In January 1968, after a lapse of 10 years, the Center attempted to buy the transformers. Of 13 companies solicited, only 1 sent in a bid. Center officials considered the firm's bid too high so they canceled the procurement and took a closer look at the specifications.

Samples of the transformers were obtained and some value engineering therapy was applied to them. This included preparation of new drawings, and revision and inclusion of greater detail in existing drawings. The contracting officer called a presolicitation conference with leading X-ray equipment manufacturers and the military services' requirements were explained to all.

On the Center's second try at purchasing, seven firms sent in bids. Westinghouse Electric's low bid won the contract and cut the cost of 168 transformers by an average of $892 a piece, for a total saving of $149,856.

ZERO DEFECTS CHAPTER FORMED

An affiliate of the American Society for Zero Defects was formed in the Washington, D.C., area recently. The aims and objectives of the society are to promote and further the advancement of knowledge and application of techniques and motivational approaches for the purpose of eliminating defects attributable to human error and the maintenance of high professional standing among its members. Inquiries may be addressed to WASZD Headquarters, 6217 Glenview Court, Alexandria, Va. 22312, or to Frank Curhan (Navy), President, Ox 6–4889.

THE DEFENSE DEPARTMENT COST REDUCTION PROGRAM

The following is excerpted from the Statement of former Secretary of Defense Robert S. McNamara before the Senate Armed Services Committee on the Fiscal Year 1969–73 Defense Program and the Fiscal Year 1969 Defense Budget.

While timely organizational changes, better analyses and improved procedures can all help to facilitate the management task, economy and efficiency in the day-to-day execution of the Defense program rests largely in the hands of the tens of thousands of military and civilian managers in the field. As I have noted in previous years how to motivate these people to do their job more efficiently, and how to determine whether they do so, has always been one of the most difficult and elusive problems facing the top management of the Defense Department.

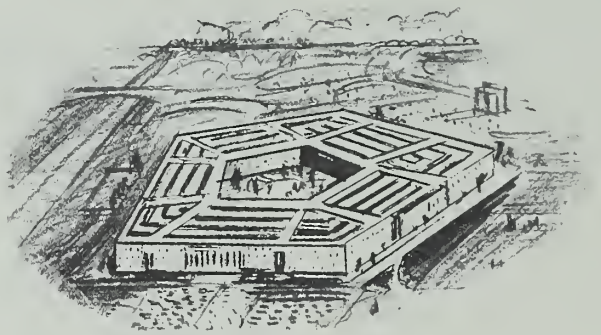
Unlike private industry, which operates under the discipline of the profit and loss statement, there is no such built-in incentive for efficiency and economy in the operating environment of the Defense Department, or for that matter, in the Government as a whole. Moreover, because of the large number of the Defense managers involved and the literally tens of millions of individual decisions they make each year (e.g., 15 million purchase actions alone in fiscal year 1967), it is obviously impossible to supervise the performance of these people directly from the Pentagon. Yet, the larger the number of intermediate management levels—and in an organization of the size of the Defense Department the number cannot help but be large—the more difficult it is to exert pressure from the top.

But even where poor performance is found, the remedies, as a practical matter, are more limited than the average person would think; the competition for

competent management personnel is extremely keen, and we have no assurance that the people we could hire would be any better than those we might fire. Accordingly, the only workable solution I have been able to find, in private industry as well as Defense, is to make the best use of the talent available, not so much through the negative threat of sanctions, but rather through the positive use of incentives for better performances. In other words, we must devise some sort of management system through which we can mobilize the capabilities of the managers at the lower levels, involve them more intimately in the entire management process, and motivate them to seek out and develop more efficient ways of doing their jobs—and that is the fundamental purpose of the Defense Department's Cost Reduction Program.

1. The Initial 5-Year Program

Initially, a 5-year program ending in fiscal year 1966 was laid out. Ultimately, some 28 distinct areas of logistics management were carefully delineated and grouped under the three major overall objectives of the program—i.e., to buy only what we need, to buy at the lowest sound price and to reduce operating costs. Specific annual cost reduction goals were established, in cooperation with the key logistics managers, for each of these areas. Selected goals, in turn, were established for the military departments and Defense agencies, and subdivided down to the lowest responsible operating levels, so that all of our principal logistics managers would know exactly what was expected of them. A quarterly reporting system was designed to measure progress against these goals, and each Service Secretary and Agency head was directed to review personally the progress achieved and to report the results to my office. I then carefully reviewed these results, myself, and reported on them to the President and the Congress each year. Indeed, both President Kennedy and President Johnson have given this program their personal attention. President Johnson has personally participated in our annual awards ceremonies.



Inasmuch as almost three-quarters of the total Defense budget is spent for "logistics" in the broadest sense of that term—i.e., beginning with research and development and extending through procurement, production, construction of facilities, supply, maintenance etc., and ending with the disposal of surplus materiel and facilities—we concentrated our efforts, first, on that area of activity. Even before I took office I made it my business to familiarize myself with the principal studies and reports relating to Defense logistics, e.g., those of the Hoover Commissions, the General Accounting Office and the various congressional committees. From these reports, I and my associates were able to identify the key areas in which improvements were urgently needed and where the potential for significant savings was the greatest.

The problem, then, was how to organize the effort on a Defensewide basis. From past experience in the Defense Department we knew that "one-shot," transient efforts soon petered out, leaving no real long-term benefits. We also knew that without clear-cut goals and a system for measuring progress against those goals, the principal incentive for improvement would be lost. And finally, we realized that unless the top management, itself, placed a high priority on the effort, managers at lower levels would soon lose interest in the program.

In order to ensure that we were not kidding ourselves or the public regarding the validity of the savings being achieved, I tried at the beginning to enlist the aid of the General Accounting Office in auditing these savings. As you know, the GAO, for understandable reasons, declined to undertake this task (more recently it has agreed to review the adequacy of our Cost Reduction audit program and our criteria for measuring savings). Consequently, I assigned the audit function to the Defense Comptroller, who, although a member of my staff, is not directly involved in the logistics management function.

In this connection, we must remember that it is extremely difficult to establish precise auditing standards for this sort of activity, and to some extent subjective judgments are bound to intrude in the evaluation of what constitutes a true savings. Nevertheless, we have consistently tried to apply one basic test, namely,

that a reportable savings must result from a clearly identifiable, new, improved or intensified management action which actually reduces costs while fully satisfying the military requirement. And, I believe, that by and large the savings we have reported over the years have met that basic test.

But over and above the large monetary savings achieved—more than $14 billion during the 5-year period—the program has significantly raised the level of effectiveness of our entire worldwide logistics system. New procurement techniques were developed and brought into everyday use to broaden the area of competition for Defense work and to minimize the use of cost-plus-fixed-fee contracts. Requirements computation methods were thoroughly reviewed and more realistic standards established. New procedures were devised to ensure maximum utilization of excess inventories on a Departmentwide basis. Special "value engineering" staffs were organized in all of the Department's procurement agencies to eliminate "goldplating" (i.e., unneeded frills) from specifications. Defense contractors were offered a share in the savings resulting from "value engineering" changes which they originated. Programs designed to increase the efficiency of the day-to-day operations of the Department were established at the base level. Defense installations were systematically reviewed and those excess to our requirements were closed and the property turned over to more productive public or private use.

2. *The Permanent Cost Reduction Program*

With the completion of the initial 5-Year program in fiscal year 1966 and with the basic policies and procedures firmly established throughout the Department, the program was placed on an annual basis in fiscal year 1967. We have now completed the first of the annual programs and are halfway through the second. As I told you last year for fiscal year 1967 *actions* we established a goal of $1.5 billion in savings to be realized in fiscal years 1967, 1968, and 1969, with $872 million of that amount to be realized in fiscal year 1967 itself. Results have exceeded our objectives. (A complete summary of the results can be found on page 60.)

In previous years. I have discussed each area of the program in some detail, giving specific examples of the savings achieved. This year I would like, instead, to review the overall status of this program and the prospects for the future.

3. *The Future Program*

As I have noted many times before, the management task is never finished, and this is particularly true of cost reduction. Even while old deficiencies are being corrected, entirely new ones make their appearance. And, this is to be expected since the character and content of the Defense program is constantly changing.

The recent buildup of our forces in support of our commitments in Southeast Asia is a good case in point. The extent and speed of this buildup and the great distances over which our forces had to be deployed and supported have placed a great deal of pressure on our entire logistics system. And, of course, whenever the element of time becomes the overriding factor in our actions, economy and efficiency tend to be sacrificed in favor of speed. It was for this reason that I cautioned last July, in my Annual Progress Report on the Cost Reduction Program, that, "I would not be at all surprised if some unnecessary spending and inefficiency have crept into the Defense program during these last 2 years of rapid buildup." I went on to say, "Our task in the year ahead . . . is to ferret out all of these new sources of waste and inefficiency and tighten up our operations all along the line. Further savings of millions of dollars can be achieved by actions which are completely consistent with a high degree of combat readiness."

I was delighted, therefore, last October when I learned that General Westmoreland, acting on his own initiative, had instituted a cost reduction program in his own area of responsibility. The objective of that program in his words is "to develop a well-balanced, hard-hitting and efficient military force which can be sustained at a minimum cost for an indefinite period." To accomplish that objective, he has laid out a comprehensive program, complete with goals for each of the major logistics areas and a quarterly report on progress toward those goals, the first of which will cover the period ending March 1968.

Now, with regard to the longer range goals of the Cost Reduction Program, although we must realize that the very large savings achieved during the first 5 years are not likely to be duplicated during the succeeding 5 years, there are still significant opportunities for improvement in many areas.

a. Buying Only What We Need

There are a number of logistics areas under this general heading where the opportunities for improvement are virtually unlimited. This is so because requirements are always changing, new items are continuously entering the inventories while older items are becoming obsolete and surplus to our needs.

Over the last 7 years we have conducted literally thousands of "requirement" reviews of major items of equipment, spare parts and consumables to help us determine our real needs and avoid procurement of materiel which might later become surplus. More accurate predictions of wearout rates are being made through the use of automatic data processing equipment. Pipeline requirements are being reduced by the use of airlift to deliver high cost items, particularly to Southeast Asia.

Better demand forecasts are being achieved through the widespread use of high-speed communication systems and by concentrating management effort on high-value items. Special review boards have been established to screen the need for the thousands of reports, manuals, engineering drawings and other technical data required to develop, operate and maintain our equipment.

The importance of this entire requirements review process has been brought to the forefront by the Vietnam conflict, particularly with regard to such high consumption items as ammunition. For example, we have fully automated the Southeast Asia Air Munitions Reporting System, and we now receive a status report every 15 days on the 53 most important air munitions items—including combat consumption, training consumption, inventory levels, and stocks in the pipeline. These reports are received within 10 days from the end of each reporting period, permitting us to respond promptly to any change in the combat consumption of these 53 items. A similar reporting system has been established for the principal items of ground ammunition. Both of these reports will make it possible for us to meet our requirements without generating huge excesses as was the case during the Korean war. In fact, we are deliberately holding our worldwide inventories below the required peacetime "cold production base" level, both to avoid "overbuying" during the war and to soften the impact on the economy when the conflict ends and production has to be cut back to peacetime rates. By phasing down production gradually over a period of months, the employees, contractors and communities affected will have a better opportunity to make the necessary adjustments.

There is considerable room for improvement, however, in the management of our spare parts inventories. Here, the number of items is so great that we have not yet developed a satisfactory technique for closely relating procurement and inventories to consumption. Nevertheless, we have made substantial progress in this area (the value of "approved force stocks in storage" as a percent of the value of weapons and equipment in use has fallen from 41 percent at the end of fiscal year 1961 to 33 percent at the end of fiscal year 1967), and we hope that the transfer of aircraft spares to the stock fund will stimulate additional improvements.

The acquisition of technical data is another activity in which further progress can be made. It has been estimated that there may be as many as 100 million engineering drawings in our repositories. Moreover, we have approximately a quarter of a million technical manuals and about 40,000 specifications, standards, and related documents, and we are spending perhaps as much as one and one-half billion dollars annually for additional technical data. We have attacked this problem in a number of ways, ranging from "cross servicing" of manuals among the military departments to replacing hard copies of drawings and other data with magnetic and punched tapes and computer memory banks. But I still feel we need a more comprehensive review on an item-by-item basis of each proposed procurement. There are still too many cases where we find ourselves buying technical data which nobody needs.

No matter how carefully we review our requirements, excess inventories are bound to develop as new major weapons systems replace the old. Thus, the reutilization of excess inventories will be a continuing problem. We have made good progress in this area during the past 7 years, reducing long supply and disposable stocks from about $16.5 billion in 1961 to $12.3 billion in 1967, with the rate of reutilization rising from about $956 million a year to over $1.5 billion a year during this period. Further progress will depend importantly on how well we can adapt old items to meet new needs.

One area in which the job will never be completed as long as new weapons systems and equipment continue to enter the inventories is that of value engineering or the elimination of "gold plating." We have greatly increased our capabilities in this area over the last 6 years, and we estimate that we have saved more than $1 billion during this period by eliminating superfluous design or performance features. As I noted earlier, much of this work is done by our contractors, with whom we are sharing the savings.

b. Buying at the Lowest Sound Price

The opportunities for improvement, here, have been rather fully exploited. This is particularly true in the shift away from Cost-plus-fixed-fee contracts, which neither reward good performance nor penalize bad performance. As shown on the following chart, we have completely reversed the previous trend and have driven down the proportion of contracts awarded on a CPFF basis from a peak of 38 percent in fiscal year 1961 to about 10 percent in 1967.

While we may be able to reduce the use of CPFF contracts by perhaps another percentage point when the Vietnam conflict is ended, it is apparent that there is very little room for further improvement in this area. Essentially, this type of contract is now being used only where there are great uncertainties involved in the scope of the work to be performed; for example, in research and development.

I also believe that we have gone far toward exploiting the possibilities of increasing the percentage of contracts awarded on the basis of price competition, although we should be able to reverse the slight downward trend encountered in the last year because of the Vietnam conflict. We have raised the proportion of contracts awarded on a price competitive basis from 32.9 percent in fiscal year 1961 to 44.4 percent in fiscal year 1966. In achieving these results, we have made extensive use of such devices as two-step formal advertising, the spare parts breakout program, and multiyear procurements.

An opportunity for further progress in the procurement area lies in the expanded application of the "total package" procurement method. In addition to the C–5A transport, we have used this procurement method for other systems such as the SRAM, the LOH avionics package, the FDL and the air-to-ground MAVERICK missile.

c. *Reducing Operating Costs*

There are some logistics areas included under this heading in which the opportunities for future improvement are still very exclusive, but in the area of "terminating unnecessary operations," I believe future actions will be less numerous than in the past.

During the last 7 years we have made a continuing, searching and systematic review of all of our installations and activities throughout the world. Facilities which had outlived their usefulness or were in poor condition and cost too much to operate and maintain have been closed. Those which were surplus to our peacetime and mobilization needs have been disposed of. Installations operating at below productive capacity have been shut down and their remaining useful activities consolidated at other more efficient locations. The results of this intensive 7-year effort are shown on the table below:

	Total through June 30, 1967
Number of actions	967
Real estate released (acres)	1,818,000
Industrial plants with commercial potential made available for sale	66
Job positions eliminated	207,047
Recurring annual operating savings	$1.5 billion

From the beginning, we have recognized that this rechanneling of resources, though beneficial to the Nation as a whole, could have serious adverse effects on local communities and our own employees. Two programs, each now of several years standing, were developed to help soften these effects.

One program is designed to help the local communities make the necessary adjustment and find productive uses for the land and facilities made available as a result of base closures. They are advised of pending closures months and sometimes years in advance, giving both the Defense Department and the community time to develop the adjustment plans. To assist in this process, I established in 1961 an Office of Economic Adjustment which, together with experts from other Federal agencies has helped some 72 communities in 34 States.

The following table summarizes the disposition and use of military property released since 1961:

	Total through June 30, 1967
Civil airports	36
Schools and universities	251
Parks, recreation, community development	113
Private Industry for production	66
Individuals and small companies	580
Federally owned reserve lands	11
Other Federal agencies	112
Total acres involved	944,996

The other program pertains to our own employees. Since base closures dislocate our employees as well as communities, the Defense Department as employer bears a special responsibility. We have discharged this responsibility by guaranteeing our career employees that no one displaced by a base closure will be separated without the offer of a new job opportunity. In order to help such displaced employees find jobs, we now operate a nationwide system which matches the qualifications with job vacancies, we give them preference in hiring, we guarantee their present pay for 2 years when they accept a lower paying job, and we pay their moving expenses when they relocate to a new Defense position. The table below shows the results of this program for career civilian employees (military personnel are simply reassigned to other duties—a normal feature of service life) from its inception in January 1964 through last September:

	Employees	
	Number	Percent
Accepted offer of another Defense job	84,771	67.2
Placed in another Federal job	4,599	3.7
Placed in a non-Federal job	4,986	4.0
Declined job offer, transfer or placement assistance	11,338	9.0
Retired or resigned	17,625	14.0
Other (death, military service, etc.)	2,637	2.1
Total employees affected	125,956	100.0
Separated without offer of "job opportunity"	None	None

With respect to other areas of logistics management—transportation, communications, equipment maintenance, etc.—the day-to-day operations of the Defense Department should continue to offer a broad range of opportunities for cutting costs through such actions as consolidating management functions, finding

more efficient organizational arrangements, simplifying work methods, and increasing productivity. For the most part, this type of action is taken at the installation level, and success in this area will depend importantly on the continued vigor of the Cost Reduction Program and the support it receives throughout the Government.

DOD COST REDUCTION PROGRAM

Area	Fiscal year program savings realized in [a]					Fiscal year 1967 program		Fiscal year 1968 program		Fiscal year 1969 program	
	Fiscal year 1962	Fiscal year 1963	Fiscal year 1964	Fiscal year 1965	Fiscal year 1966	Fiscal year 1967	Fiscal year 1967–69	Fiscal year 1968	Fiscal year 1968–70	Fiscal year 1969	Fiscal year 1969–71
BUYING ONLY WHAT WE NEED											
Refining requirement for:											
Major items [b]	.....	90	487	1,060	803	136	196	144	235	145	240
Initial provisioning	.....	163	218	368	215	31	61	30	45	30	45
Secondary items	348	481	643	626	53	110	123	127	149	124	146
Technical manuals	.....	.....	10	9	8	2	3	.....	.....	.....	.....
Technical data and reports	.....	.....	2	6	13	10	15	9	914	9	14
Production base facilities	.....	35	14	18	4	4	4	3	3	3	3
Increased use of excess:											
Equipment and supplies	.....	.....	57	169	114	49	62	60	80	61	79
Idle production equipment	.....	1	.....	4	20	.....	.....	.....	.....	.....	.....
Contractor inventory	.....	18	14	8	29	1	1	.....	.....	.....	.....
Eliminate "Goldplating" (VE)	64	72	76	204	324	339	609	265	440	265	440
Inventory item reduction	.....	.....	.....	83	82	3	3	.....	.....	.....	.....
Total buying only what we need	412	860	1,521	2,555	1,665	685	1,077	638	966	637	967
BUYING AT LOWEST SOUND PRICE											
Shift to competitive procurement:											
Percent competitive [c]	.....	37.1	39.1	43.4	44.4	.....	.....	.....	.....	.....	.....
Amount of savings	160	237	448	641	551	30	79	43	107	44	109
Shift to fixed incentive:											
Percent CPFF [d]	.....	20.7	12.0	9.4	9.9	.....	.....	.....	.....	.....	.....
Amount of savings	.....	.....	100	436	[g] 600	.....	.....	.....	.....	.....	.....
Direct purchase breakout	.....	.....	5	6	14	11	19	17	34	17	34
Multiyear procurement	.....	.....	.....	67	70	29	63	33	81	34	83
Total buying at lowest sound price	160	237	553	1,150	1,235	70	161	93	222	95	226
Reducing operating costs:											
Unnecessary operations	.....	123	334	484	[h] 794	[f] 7	64	.....	79	.....	80
Reducing operating expenses:											
DSA [e]	31	31	42	59	60	.....	.....	.....	.....	.....	.....
Contract administration consolidation	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	.....
Departmental	.....	.....	95	186	230	135	360	137	280	143	295
Increasing efficiency:											
Telecommunications management	75	80	131	118	153	11	40	15	32	16	36
Transportation/traffic management	24	24	7	35	[i] 84	53	140	79	162	[i] 23	51
Equipment maintenance management	48	.....	65	117	93	32	93	36	79	36	80
Noncombat vehicle management	.....	2	18	24	30	2	8	.....	.....	.....	.....
Contract technicians	.....	.....	20	26	9	4	7	.....	.....	.....	.....
Military housing management	.....	6	13	16	18	5	10	3	6	3	6
Real property management	.....	23	25	46	54	14	31	15	29	16	30
Packing/packaging	.....	.....	7	8	30	18	37	18	32	12	24
Total reducing operating costs	178	289	757	1,119	1,560	281	790	303	699	249	602
Military assistance program	.....	.....	.....	19	3	16	31	8	11	8	11
Total program	750	1,386	2,831	4,843	[j] 4,463	[k] 1,052	2,059	1,042	1,898	989	1,806

[a] Includes some nonrecurring savings.

[b] Not included in totals are reductions in the "savings requirements" for major items in fiscal year 1962 of $24 billion and in fiscal year 1963 of Army pipeline requirements of $500 million.

[c] Fiscal 1961 was 32.9 percent. Savings are 25 percent per dollar converted.

[d] First 9 months of fiscal year 1961 was 38 percent. Savings are 10 percent per dollar converted.

[e] Excludes DSA inventory drawdown of $38 million in fiscal year 1962; $62; million in fiscal year 1963; $161 million in fiscal year 1964; $51 million in fiscal year 1965.

[f] Represents savings realized as a result of fiscal year 1967 base closing decisions.

[g] Full annual effect of actions through fiscal year 1966 will be $780 million.

[h] Full annual effect of actions through fiscal year 1966 will be $1,450 million.

[i] Full annual effect of actions through fiscal year 1966 will be $120 million.

[j] Full annual effect of actions through fiscal 1966 will be $5,299 million.

[k] New reporting criteria for fiscal year 1967 measures savings on an annual basis only. The 3-year effect of fiscal year 1967 actions (fiscal year. 1967–69) amounts to a total of $2,059 million.

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